TEST REPORT

Report Number: 15496249-E28V1

Applicant	:	APPLE, INC 1 APPLE PARK WAY CUPERTINO, CA 95014, U.S.A.
Model	:	A3257
Brand	:	APPLE
FCC ID	:	BCG-E8950A
IC	:	579C-E8950A
EUT Description	:	SMARTPHONE
Test Standard(s)	:	FCC 47 CFR PART 2, PART 27 ISED RSS-GEN ISSUE 5 + A1 + A2, RSS-195 ISSUE 2

Date Of Issue:
2025-07-29

Prepared by:
UL Verification Services Inc.
47173 Benicia Street
Fremont, CA 94538, U.S.A.
TEL: (510) 319-4000
FAX: (510) 661-0888

CERT #0751.05

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	2025-07-29	Initial Review	--

UL VERIFICATION SERVICES INC.
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888

TABLE OF CONTENTS

UL VERIFICATION SERVICES INC.
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888

UL VERIFICATION SERVICES INC.
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888

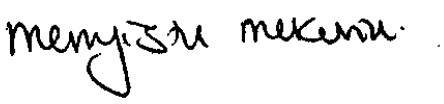
1. ATTESTATION OF TEST RESULTS

Applicant Name and Address	APPLE, INC 1 APPLE PARK WAY CUPERTINO, CA 95014, U.S.A.
Model	A3257
Brand	APPLE
FCC ID	BCG-E8950A
IC	579C-E8950A
EUT Description	SMARTPHONE
Serial Number	Radiated: HM7J7JQX6J, LFJJGD2VPV. GMHVQR27VP Conducted: HVHHH5000AY000122J, HVHHH50002D0000YE7 HVHHD20009U0000YE7
Sample Receipt Date	2025-02-28
Date Tested	2025-03-31 to 2025-07-08
Applicable Standards	FCC 47 CFR PART 2, PART 27 ISED RSS-GEN ISSUE 5 + A1 + A2, RSS-195 ISSUE 2
Test Results	COMPLIES

UL Verification Services Inc. 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 Verification Services Inc.and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc.will constitute fraud and shall nullify the document.

Approved & Released By:	Reviewed By:	Prepared By:
		
Mengistu Mekuria Staff Laboratory Engineer UL Verification Services Inc.	Eric Ting Senior Test Engineer UL Verification Services Inc.	Carlos D. Caudana Laboratory Engineer UL Verification Services Inc.

UL VERIFICATION SERVICES INC.
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888

2. SUMMARY OF TEST RESULTS

This report contains data provided by the customer which can impact the validity of results. UL Verification Services Inc. is only responsible for correctly integrating customer-provided data with measurements performed by UL Verification Services Inc.

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

1. Antenna gain and type (see section 6.4.)

Requirement Description	Requirement Clause Number (FCC)	Requirement Clause Number (ISED)	Result	Remarks
Equivalent Isotropic Radiated Power	27.50 (a) (3)	RSS195§5.5	Complies	
Occupied Bandwidth	2.1049	RSS-GEN§6.7, RSS195	Complies	
Band Edge and Emission Mask	2.1051, 27.53(a)	RSS195§5.6 & §5.6.2	Complies	
Out of Band Emissions	2.1051, 27.53(a)	RSS195§5.6.2	Complies	
Frequency Stability	2.1055, 27.54	RSS195§5.4	Complies	
Peak-to-Average Ratio	-	-	Complies	
Field Strength of Spurious Radiation	2.1053, 27.53(a)	RSS195§5.6 & §5.6.2	Complies	

UL VERIFICATION SERVICES INC.
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888

3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with the following.
FCC published lists of measurement procedures for compliance testing.
ISED published lists of normative test standards and acceptable alternatives procedures.

- ANSI C63.26:2015
- ANSI/TIA-603-E (2016)
- FCC 47 CFR Part 2, Part 27
- FCC KDB 971168 D01: Power Meas License Digital Systems (ISED acceptable alternative procedure)
- FCC KDB 971168 D02: Misc Rev Approv License Devices
- FCC KDB 412172 D01: Determining ERP and EIRP
- ISED RSS-Gen Issue 5 + A1 + A2, RSS-195 Issue 2.

4. FACILITIES AND ACCREDITATION

UL Verification Services Inc. is accredited by A2LA, certification #0751.05, 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 1: 47173 Benicia Street, Fremont, CA 94538, USA	US0104	2324A	550739
☐	Building 2: 47266 Benicia Street, Fremont, CA 94538, USA			
☒	Building 3: 843 Auburn Court, Fremont, CA 94538, USA			
☐	Building 4: 47658 Kato Rd, Fremont, CA 94538, USA			
☒	Building 5: 47670 Kato Rd, Fremont, CA 94538, USA			

UL VERIFICATION SERVICES INC.
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888

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}
Conducted Antenna Port Emission Measurement	1.940 dB
Power Spectral Density	2.466 dB
Time Domain Measurements Using SA	3.39 %
RF Power Measurement Direct Method Using Power Meter	0.450 dB Ave. 1.300 dB Peak
Radio Frequency (Spectrum Analyzer)	141.16 Hz
Occupied Bandwidth	1.22%
Worst Case Conducted Disturbance, 9KHz to 0.15 MHz	3.78 dB
Worst Case Conducted Disturbance, 0.15 to 30 MHz	3.40 dB
Worst Case Radiated Disturbance, 9KHz to 30 MHz	2.87 dB
Worst Case Radiated Disturbance, 30 to 1000 MHz	6.01 dB
Worst Case Radiated Disturbance, 1000 to 18000 MHz	4.73 dB
Worst Case Radiated Disturbance, 18000 to 26000 MHz	4.51 dB
Worst Case Radiated Disturbance, 26000 to 40000 MHz	5.29 dB

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 Apple iPhone is a smartphone with cellular GSM, GPRS, EGPRS, WCDMA, LTE, 5GNR1, 5GNR2, IEEE 802.11a/b/g/n/ac/ax/be, Bluetooth (BT), Ultra-Wideband (UWB), Global Positioning System (GPS), Near-Field Communication (NFC), Narrow-Band (NB) UNII, 802.15.4, 802.15.4ab-Narrow Band (NB), Wireless Power Transfer (WPT) and Mobile Satellite Service (MSS) technologies. The rechargeable battery is not user accessible. This device is not user-serviceable and requires special tools to disassemble.

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:

UL VERIFICATION SERVICES INC.
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888

LTE BAND 30

Part 27 / RSS 195	
EIRP Limit (W)	0.25
Antenna Gain (dBi) (Ant 2)	-1.20

Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Average (W)	99% BW (MHz)	99% BW (kHz)	Emission Designator
5.0	QPSK	2307.5	2312.5	24.70	23.50	0.224	4.527	4527	4M53G7W
	16QAM			23.43	22.23	0.167	4.524	4524	4M52D7W
10.0	QPSK	2310.0	2310.0	24.70	23.50	0.224	8.998	8998	9M00G7W
	16QAM			24.17	22.97	0.198	8.988	8988	8M99D7W

5G NR n30

Part 27 / RSS 195	
EIRP Limit (W)	0.25
Antenna Gain (dBi) (Ant 2)	-1.20

Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Average (W)	99% BW (MHz)	99% BW (kHz)	Emission Designator
5.0	BPSK	2307.5	2312.5	24.70	23.50	0.224	4.495	4495	4M50G7W
	QPSK			24.70	23.50	0.224	4.486	4486	4M49G7W
	16QAM			24.54	23.34	0.216	4.490	4490	4M49D7W
10.0	BPSK	2310.0	2310.0	24.62	23.42	0.220	8.919	8919	8M92G7W
	QPSK			24.70	23.50	0.224	8.951	8951	8M95G7W
	16QAM			24.51	23.31	0.214	8.974	8974	8M97D7W

6.3. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was version 0.08.00.

6.4. MAXIMUM ANTENNA GAIN AND MAXIMUM ALLOWED OUTPUT POWER

The IFA antenna(s) gain/ allowed output power, as provided by the manufacturer' are as follows:

Bands	Frequency Range (MHz)	Antenna	Gain (dBi)	Max Allowed Conducted Output Power (dBm)	ERP/EIRP (dBm)
LTE Band 30	2305 - 2315	ANT1	-3.60	24.2	20.60
		ANT2	-1.20	24.7	**23.50**
		ANT3	-1.90	25.4	**23.50**
		ANT4	-1.50	24.7	23.20
5G NR n30	2305 - 2315	ANT1	-3.60	23.7	20.10
		ANT2	-1.20	24.7	**23.50**
		ANT3	-1.90	25.2	23.30
		ANT4	-1.50	24.2	22.70

6.5. WORST-CASE CONFIGURATION AND MODE

This report covers the following technologies:

- LTE Band 30, 5G NR n30

For 5G NRs, conducted spurious emission tests were conducted on wider bandwidth with inner 1RB since this is the worst bandwidth and the highest output power.

BPSK modulation applied only for 5G NR frequencies and has the same tune up power as QPSK modulations.

The DFT-s-OFDM and CP-OFDM waveforms were investigated, and DFT-s-OFDM was found to be the worst case.

The worst-case scenario for all measurements is based on an engineering evaluation made on different modulations. Then, QPSK and BPSK were observed as the worst mode to LTE bands and 5G NR bands respectively and set for all conducted and radiated. Output power measurements were measured on BPSK, QPSK, 16QAM, 64QAM, and 256QAM modulations. For testing purposes emissions on section 9 were measured while QPSK/BPSK was set at or above target power for all bands. Conducted tests were performed on the worst-case antenna port because it has the highest conducted power. The worst-case antenna port is shown in the table below.

LTE and 5G NR Bands	Worst case Antenna Port
LTE Band 30, 5G NR n30	Ant 3

The EUT was investigated in three orthogonal orientations X/Y/Z on all available antennas to determine the worst-case orientation. The following table exhibits the worst-case orientation. The full tests of the EUT have made upon the orientations that shown in the table below.

Frequency Range	ANT3	ANT4	ANT2	ANT1
2300 – 2700 MHz	Y	X	X	Y

Radiated spurious emissions were investigated from 9kHz to 30MHz, 30MHz-1GHz and above 1GHz. There were no emissions found with less than 20dB of margin from 9kHz to 30MHz, 30MHz-1GHz and above 18GHz.

For simultaneous transmission of multiple channels in the 2.4GHz/5GHz WLAN, UWB, and Cellular bands, tests were conducted for various configurations having the highest power, least separation in frequencies and widest operation bandwidths. No noticeable new emission was found.

6.6. DESCRIPTION OF TEST SETUP

Refer to Appendix A for description of test setup.

7. TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Asset**	**Cal Due**
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	169933	2026-02-28
Antenna, Horn 1-18GHz	ETS Lindgren	3117	226673	2026-02-28
RF Filter Box, 1-18GHz, 12 Port	UL-FR1	Frankenstein	231874	2026-06-29
Wideband Communication Test Set, Call Box	R&S GmbH & Co.	CMW500	85723	2026-02-28
Antenna, Horn 1-18GHz	ETS Lindgren	3117	250003	2026-02-28
RF Filter Box, 1-18GHz, 12 Port	UL-FR1	Frankenstein	231876	2026-04-30
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	223459	2026-02-27
Antenna, Broadband Hybrid, 30MHz to 3GHz	Sunol Sciences Corp.	JB3	171863	2026-11-30
Amplifier 9 KHz - 1 GHz	SONOMA INSTRUMENT	310N	224490	2026-05-06
Antenna, Passive Loop 30Hz - 1MHz	ELECTRO-METRICS	EM-6871	170013	2025-07-31
Antenna, Passive Loop 100KHz - 30MHz	ELECTRO-METRICS	EM-6872	170015	2025-07-31
PXA Signal Analyzer	Keysight Technologies Inc	N9030B	262735	2026-03-30
PXA Signal Analyzer	Keysight Technologies Inc	N9030B	231912	2026-04-30
Antenna, Horn 18 to 26.5GHz	A.R.A.	MWH-1826/B	172353	2025-08-31
Link File, RF Amplifier Assembly, 18-26.5GHz, 60dB Gain	AMPLICAL	AMP18G26.5-60	220194	2026-04-29
Antenna, Horn 26.5-40GHz	A.R.A	MWH-2640/B	81105	2025-08-31
Link File, RF Amplifier Assembly, 26.5-40GHz, 65dB Gain	Amplical	AMP26G40-65	220193	2026-04-30
PXA Signal Analyzer	Keysight Technologies Inc	N9030B	259079	2026-02-28
PXA Signal Analyzer	Keysight Technologies Inc	N9030B	262734	2026-04-30
Wideband Communication Call Box	Rohde & Schwarz	CMW500	230298	2026-02-28
Wideband Communication Call Box	Rohde & Schwarz	CMW500	85943	2026-02-28
Wideband Communication Call Box	Rohde & Schwarz	CMW500	262742	2027-02-11
Wideband Communication Call Box	Rohde & Schwarz	CMW500	262741	2027-02-11
Conducted Switch Box	N/A	CSB	221008	2026-04-30
Conducted Switch Box	N/A	CSB	262354	2026-04-30
Filter, BRF 3400-3800MHz, 18GHz max	Micro-Tronics	BRM50711	217364	2025-09-30
Filter, BRF 2305-2315	Micro-Tronics	BRC20553	224186	2026-06-29
Directional Coupler	KRYTAR	152610	254457	2025-10-31
Directional Coupler	KRYTAR	101040010K	254458	2025-10-30
Power Meter, P-series single channel	Keysight Technologies Inc	N1911A	90718	2026-03-31
Power Sensor, P - series, 50MHz to 18GHz, Wideband	Keysight Technologies Inc	N1921A	257704	2026-03-31
Chamber, Environmental	Cincinnati Sub Zero	ZPHS-8-3.5-SCT/WC	89097	2025-10-31

UL AUTOMATION SOFTWARE			
Conducted Software	UL	CLT	Ver.2024.3.20.0 & v2023.3.3.0
Conducted Software	UL	Antenna Port	Ver.2022.8.16
Conducted Software	UL	Station Tool	Ver.v2025.4.1, v2025.4.8 & v2025.6.1
Radiated Software	UL	UL EMC	Ver 9.5, May 1, 2023

8. RF OUTPUT POWER VERIFICATION

CONDUCTED OUTPUT POWER MEASUREMENT PROCEDURE

All bands conducted average power is obtained from the base station simulator.

The following tests were conducted according to the test requirements outlined in ANSI C63.26 Section 5.2.

RESULTS

The EUT has different power levels for head use configuration and body use configuration. All measurements are made with the device operating at the highest average conducted output powers.

UL VERIFICATION SERVICES INC.
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888

8.1. LTE BAND 30

Test Engineer ID:	27957	Test Date:	2025-03-25

OUTPUT POWER FOR LTE BAND 30 (5.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Conducted Average (dBm)											
				ANT 3			ANT 4			ANT 2			ANT 1		
				27685	27710	27735	27685	27710	27735	27685	27710	27735	27685	27710	27735
				2307.5	2310.0	2312.5	2307.5	2310.0	2312.5	2307.5	2310.0	2312.5	2307.5	2310.0	2312.5
5.0	QPSK	1	0	**25.40**	**25.40**	**25.40**	24.57	24.47	24.56	**24.70**	24.57	24.67	**24.20**	24.19	**24.20**
		1	12	25.40	25.38	25.39	24.69	24.64	24.64	24.63	24.62	24.69	24.12	**24.20**	24.15
		1	24	25.37	25.35	25.38	**24.70**	**24.70**	**24.70**	24.62	24.64	24.67	24.14	24.19	24.17
		12	0	25.11	25.18	25.21	23.48	23.51	23.58	24.44	24.33	24.45	23.10	23.12	23.09
		12	6	25.19	25.22	25.20	23.56	23.50	23.65	24.49	24.40	24.48	23.14	23.16	23.17
		12	11	25.09	25.05	25.13	23.56	23.47	23.61	24.42	24.31	24.45	23.02	23.11	23.09
		25	0	25.09	25.03	25.14	23.51	23.40	23.60	24.42	24.29	24.42	23.05	23.09	23.10
	16QAM	1	0	24.82	24.85	**24.88**	23.65	23.61	23.68	24.16	24.06	24.16	23.43	23.26	23.32
		1	12	24.86	24.87	24.85	23.77	23.73	23.82	24.14	**24.20**	**24.20**	23.29	**23.43**	23.33
		1	24	24.85	24.79	24.84	23.81	23.73	**23.84**	24.06	24.05	24.16	23.35	23.30	23.29
		12	0	23.62	23.72	23.69	22.57	22.49	22.57	22.95	22.89	22.94	22.13	22.15	22.15
		12	6	23.65	23.70	23.71	22.61	22.47	22.67	23.00	22.84	23.06	22.16	22.18	22.14
		12	11	23.58	23.53	23.66	22.57	22.49	22.64	22.99	22.82	23.01	22.08	22.14	22.13
		25	0	23.60	23.57	23.66	22.55	22.45	22.60	22.89	22.81	22.92	22.14	22.12	22.12
	64QAM	1	0	23.76	23.78	23.73	22.67	22.60	22.68	23.04	22.97	23.02	22.24	22.26	22.24
		1	12	**23.88**	23.86	23.84	22.81	22.72	**22.85**	23.03	23.03	**23.08**	22.27	22.26	22.26
		1	24	23.82	23.75	23.75	22.82	22.71	22.81	23.06	22.94	23.02	22.16	**22.31**	22.20
		12	0	22.68	22.71	22.73	21.60	21.52	21.63	21.94	21.87	21.98	21.18	21.21	21.14
		12	6	22.68	22.80	22.75	21.62	21.51	21.72	22.01	21.88	22.00	21.24	21.26	21.23
		12	11	22.64	22.63	22.67	21.63	21.50	21.70	21.89	21.79	21.94	21.19	21.20	21.17
		25	0	22.60	22.60	22.71	21.57	21.49	21.61	21.90	21.82	21.93	21.14	21.17	21.13
	256QAM	1	0	20.79	20.76	20.82	19.67	19.61	19.65	19.92	19.95	20.04	19.33	19.24	19.23
		1	12	20.86	20.79	**20.94**	**19.89**	19.71	19.79	**20.09**	20.07	20.04	**19.35**	19.33	19.30
		1	24	20.76	20.60	20.67	19.79	19.57	19.64	19.89	19.84	19.97	19.16	19.17	19.15
		12	0	20.65	20.66	20.69	19.55	19.54	19.59	19.92	19.86	19.92	19.15	19.14	19.14
		12	6	20.62	20.75	20.74	19.65	19.52	19.65	19.97	19.87	19.99	19.18	19.23	19.16
		12	11	20.59	20.58	20.70	19.63	19.50	19.66	19.87	19.81	19.92	19.12	19.18	19.13
		25	0	20.61	20.62	20.66	19.61	19.45	19.65	19.88	19.79	19.93	19.16	19.17	19.10

OUTPUT POWER FOR LTE BAND 30 (10.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Conducted Average (dBm)											
				ANT 3			ANT 4			ANT 2			ANT 1		
				N/A	27710	N/A	N/A	27710	N/A	N/A	27710	N/A	N/A	27710	N/A
				N/A	2310.0	N/A	N/A	2310.0	N/A	N/A	2310.0	N/A	N/A	2310.0	N/A
10.0	QPSK	1	0		25.32			20.45			24.62			24.15	
		1	24		**25.40**			**24.70**			**24.70**			23.62	
		1	49		25.35			20.79			24.62			**24.20**	
		25	0		25.17			23.56			24.42			23.20	
		25	12		25.15			23.65			24.44			23.21	
		25	24		24.98			23.71			24.41			23.14	
		50	0		25.13			20.61			24.42			23.15	
	16QAM	1	0		25.34			19.59			24.10			**23.41**	
		1	24		**25.37**			**23.95**			**24.17**			23.31	
		1	49		25.33			21.88			24.09			23.27	
		25	0		24.16			22.58			22.92			22.25	
		25	12		24.17			22.68			22.94			22.23	
		25	24		24.20			22.74			22.90			22.13	
		50	0		24.15			21.65			22.89			22.13	
	64QAM	1	0		23.97			20.74			23.16			22.38	
		1	24		**24.09**			**22.96**			**23.18**			**22.43**	
		1	49		24.07			20.98			23.06			22.41	
		25	0		22.96			21.60			21.89			21.23	
		25	12		22.95			21.71			21.92			21.25	
		25	24		22.84			21.73			21.87			21.19	
		50	0		22.84			20.66			21.91			21.14	
	256QAM	1	0		20.98			20.62			20.04			20.40	
		1	24		**21.04**			**21.92**			**20.06**			**20.44**	
		1	49		20.86			20.91			19.99			20.16	
		25	0		20.90			20.56			19.91			20.24	
		25	12		20.91			20.66			19.91			20.27	
		25	24		20.84			20.72			19.86			20.16	
		50	0		20.85			20.68			19.87			20.16	

8.2. 5G NR n30

Test Engineer ID:	32894	Test Date:	2025-03-21

OUTPUT POWER FOR 5G NR n30 (5.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Conducted Average (dBm)											
				ANT 3			ANT 4			ANT 2			ANT 1		
				461500	462000	462500	461500	462000	462500	461500	462000	462500	461500	462000	462500
				2307.5	2310.0	2312.5	2307.5	2310.0	2312.5	2307.5	2310.0	2312.5	2307.5	2310.0	2312.5
5.0	BPSK	1	0	23.23	23.22	23.32	22.41	22.39	22.44	22.83	22.84	22.74	21.84	21.74	21.90
		1	1	20.20	20.20	20.20	19.20	19.20	19.20	19.70	19.68	19.70	18.70	18.70	18.70
		1	23	20.17	20.16	20.14	19.03	19.11	19.05	19.66	19.70	19.67	18.59	18.65	18.52
		1	24	23.22	23.41	23.31	22.21	22.22	22.37	22.84	22.86	22.74	21.70	21.88	21.72
		12	6	**25.20**	**25.20**	**25.20**	**24.20**	**24.20**	**24.20**	**24.70**	**24.70**	**24.70**	**23.70**	**23.70**	**23.70**
		25	0	24.99	25.05	25.08	23.27	23.98	24.04	24.63	24.57	24.61	23.49	23.46	23.52
	QPSK	1	0	23.22	23.21	23.31	22.39	22.38	22.43	22.82	22.83	22.73	21.83	21.73	21.89
		1	1	20.19	20.19	20.19	19.19	19.19	19.19	19.69	19.67	19.69	18.69	18.69	18.69
		1	23	20.16	20.15	20.13	19.02	19.10	19.04	19.65	19.69	19.66	18.58	18.64	18.51
		1	24	23.21	23.40	23.30	22.18	22.21	22.36	22.83	22.85	22.73	21.69	21.87	21.71
		12	6	25.19	**25.19**	25.19	24.18	24.19	**24.19**	24.69	**24.69**	24.69	23.69	**23.69**	23.69
		25	0	24.98	25.04	25.07	23.26	23.97	24.03	24.62	24.56	24.60	23.48	23.45	23.51
	16QAM	1	0	23.40	23.25	23.30	22.24	22.45	22.36	22.92	22.90	22.73	21.79	21.73	21.82
		1	1	24.22	24.25	24.38	23.38	23.43	23.42	23.77	23.89	23.72	**22.93**	22.73	22.71
		1	23	**24.44**	24.25	24.41	23.22	23.30	23.22	**23.94**	23.84	23.70	22.89	22.73	22.83
		1	24	23.38	23.41	23.37	22.44	22.24	22.31	22.88	22.76	22.93	21.90	21.78	21.86
		12	6	24.32	24.43	24.38	23.33	**23.44**	23.42	23.89	**23.94**	23.81	22.75	22.73	22.76
		25	0	23.24	23.23	23.42	22.34	22.24	22.38	22.85	22.81	22.74	21.77	21.70	21.92
	64QAM	1	0	22.76	22.90	22.84	21.84	21.80	21.70	22.37	22.27	22.28	21.22	21.26	21.34
		1	1	22.78	22.80	22.71	**21.99**	21.94	21.76	22.37	22.36	22.22	21.33	21.32	21.40
		1	23	22.80	**23.00**	22.74	21.74	21.97	21.97	22.30	22.35	22.27	21.40	21.21	21.27
		1	24	22.82	22.84	22.70	21.87	21.86	21.84	22.23	22.37	22.36	21.23	21.37	21.20
		12	6	22.75	22.77	22.71	21.93	21.73	21.96	22.33	22.25	**22.45**	21.23	21.33	**21.50**
		25	0	22.88	22.81	22.73	21.90	21.91	21.85	22.20	22.39	22.35	21.21	21.28	21.48
	256QAM	1	0	20.86	20.94	20.74	19.96	19.90	19.93	20.41	20.39	20.50	19.32	19.39	19.50
		1	1	21.10	21.12	21.15	19.94	**20.18**	20.00	20.42	20.57	**20.62**	19.67	19.56	**19.70**
		1	23	21.07	20.91	21.02	20.00	19.99	20.15	20.57	20.53	20.50	19.56	**19.70**	19.58
		1	24	20.82	20.84	20.76	19.96	19.97	19.96	20.44	20.44	20.31	19.36	19.41	19.49
		12	6	20.90	21.02	20.98	20.00	19.95	20.04	20.46	**20.62**	**20.62**	19.49	19.60	19.44
		25	0	21.10	21.14	**21.16**	20.16	20.13	19.94	20.54	20.48	20.61	19.48	19.52	19.57

OUTPUT POWER FOR 5G NR n30 (10.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Conducted Average (dBm)											
				ANT 3			ANT 4			ANT 2			ANT 1		
				N/A	462000	N/A	N/A	462000	N/A	N/A	462000	N/A	N/A	462000	N/A
				N/A	2310.0	N/A	N/A	2310.0	N/A	N/A	2310.0	N/A	N/A	2310.0	N/A
10.0	BPSK	1	0		20.20			19.20			20.20			19.13	
		1	1		20.70			19.15			20.30			19.11	
		1	50		20.64			19.12			20.50			19.20	
		1	51		20.20			19.12			20.44			19.00	
		25	12		25.15			**24.20**			**24.62**			**23.70**	
		50	0		**25.20**			24.08			24.60			23.55	
	QPSK	1	0		20.06			19.24			20.45			19.00	
		1	1		20.70			19.20			20.15			19.20	
		1	50		20.58			19.16			20.45			19.18	
		1	51		19.96			19.33			20.15			19.13	
		25	12		**25.20**			**24.20**			**24.70**			**23.69**	
		50	0		24.89			23.86			24.65			23.40	
	16QAM	1	0		20.45			19.20			20.23			19.14	
		1	1		20.18			19.18			20.33			19.20	
		1	50		20.26			19.20			20.35			19.19	
		1	51		20.39			19.88			20.45			19.30	
		25	12		**24.70**			**23.76**			**24.51**			**23.27**	
		50	0		23.71			22.84			24.43			22.32	
	64QAM	1	0		20.36			19.45			20.36			19.12	
		1	1		20.16			19.20			20.45			19.20	
		1	50		20.26			19.20			20.40			19.13	
		1	51		20.32			19.50			20.45			19.11	
		25	12		23.21			**22.20**			**23.91**			21.74	
		50	0		**23.29**			22.19			23.90			**21.77**	
	256QAM	1	0		20.21			19.08			20.10			19.20	
		1	1		20.16			19.15			20.13			19.18	
		1	50		20.15			19.10			20.15			19.13	
		1	51		20.26			19.09			20.30			19.11	
		25	12		21.25			20.21			**21.97**			19.68	
		50	0		**21.28**			**20.24**			21.87			**20.22**	

9. CONDUCTED TEST RESULTS

9.1. OCCUPIED BANDWIDTH

RULE PART(S)

FCC: §2.1049
ISED: RSS195

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 teste.

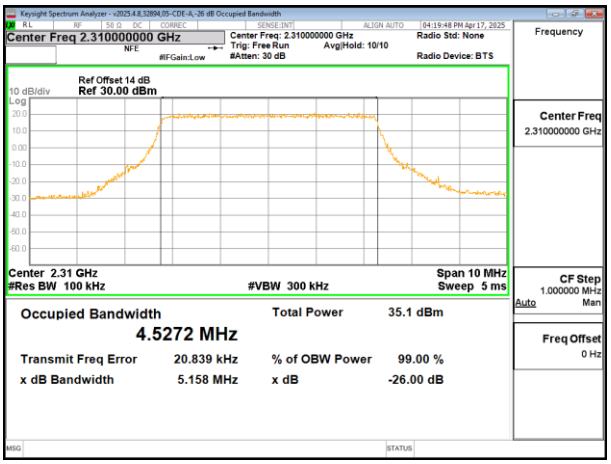
LTE BAND 30

Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 30	5MHz, QPSK	25/0	2310.0	4.527	5.16
	5MHz, 16QAM			4.524	5.18
	10MHz, QPSK	50/0		8.998	10.03
	10MHz, 16QAM			8.988	10.00
	10MHz, QPSK	1/0		0.249	0.42

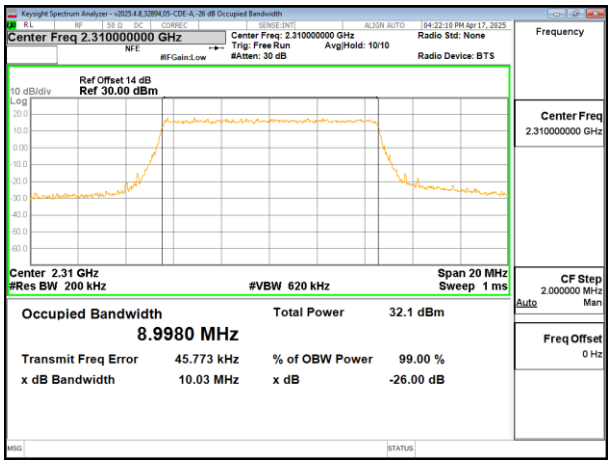
5G NR n30

Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
5G NR n30	5MHz, BPSK	25/0	2310.0	4.495	5.07
	5MHz, QPSK			4.486	5.09
	5MHz, 16QAM			4.490	5.11
	10MHz, BPSK	50/0		8.919	9.66
	10MHz, QPSK			8.951	9.84
	10MHz, 16QAM			8.974	9.65
	10MHz, BPSK	1/0		0.240	0.38

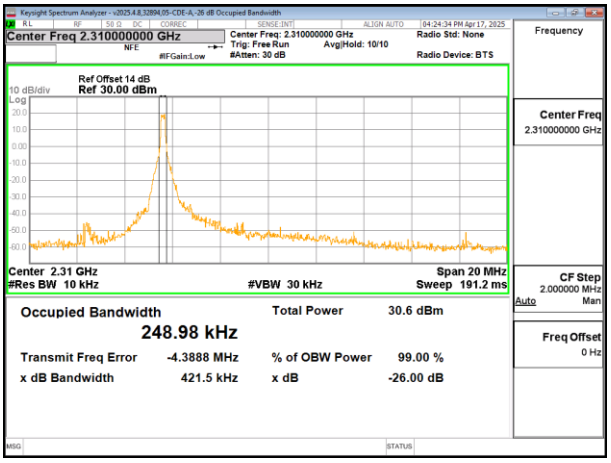
9.1.1. LTE BAND 30



LTE B30 5MHz QPSK Middle Channel RB25-0



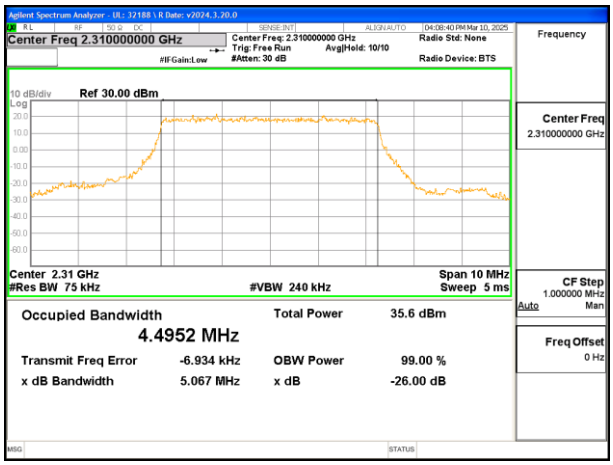
LTE B30 10MHz QPSK Middle Channel RB50-0



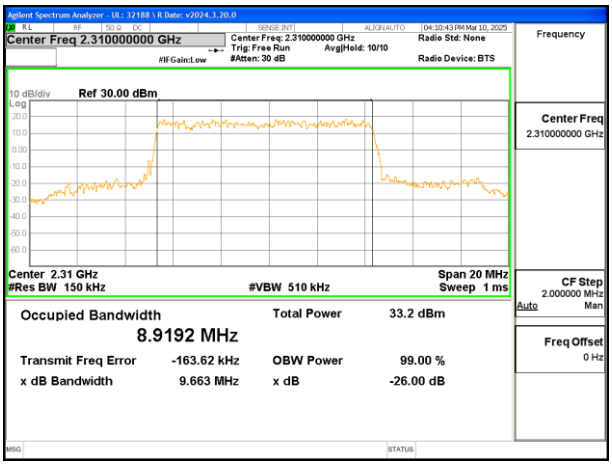
LTE B30 10MHz QPSK Middle Channel RB1-0

Intentionally Blank

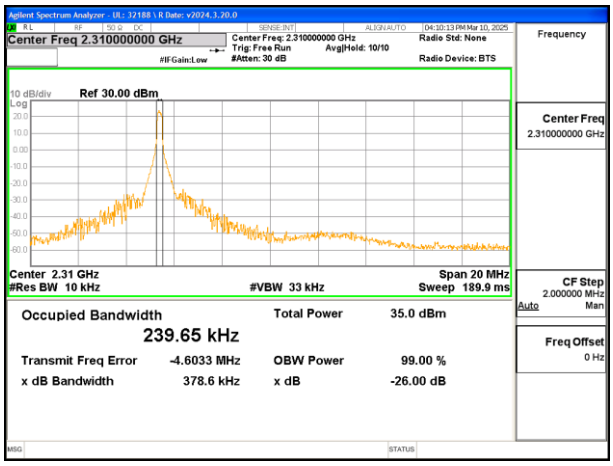
9.1.2. 5G NR n30



5G NR n30 5MHz BPSK Middle Channel RB25-0



5G NR n30 10MHz BPSK Middle Channel RB50-0



5G NR n30 10MHz BPSK Middle Channel RB1-0

Intentionally Blank

9.2. EMISSION MASK AND ADJACENT CHANNEL POWER

LIMITS

FCC: §27.53
(a) For operations in the 2305-2320 MHz band and the 2345-2360 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power P (with averaging performed only during periods of transmission) within the licensed band(s) of operation, in watts, by the following amounts:

(4) For mobile and portable stations operating in the 2305-2315 MHz and 2350-2360 MHz bands:

(i) By a factor of not less than: 43 + 10 log (P) dB on all frequencies between 2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation, not less than 55 + 10 log (P) dB on all frequencies between 2320 and 2324 MHz and on all frequencies between 2341 and 2345 MHz, not less than 61 + 10 log (P) dB on all frequencies between 2324 and 2328 MHz and on all frequencies between 2337 and 2341 MHz, and not less than 67 + 10 log (P) dB on all frequencies between 2328 and 2337 MHz;

(ii) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2300 and 2305 MHz, 55 + 10 log (P) dB on all frequencies between 2296 and 2300 MHz, 61 + 10 log (P) dB on all frequencies between 2292 and 2296 MHz, 67 + 10 log (P) dB on all frequencies between 2288 and 2292 MHz, and 70 + 10 log (P) dB below 2288 MHz;

(iii) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2360 and 2365 MHz, and not less than 70 + 10 log (P) dB above 2365 MHz.

ISED: RSS195§5.6
The transmitter unwanted emissions shall be measured with a resolution bandwidth of 1 MHz. A smaller resolution bandwidth is permitted provided that the measured power is integrated over the full required measurement bandwidth of 1 MHz. However, in the 1 MHz bands immediately adjacent to the edges of the frequency range(s) in which the equipment is allowed to operate, a resolution bandwidth of as close as possible to, without being less than 1% of the occupied bandwidth, shall be employed provided that the measured power is integrated over the full required measurement bandwidth of 1 MHz.

RSS195§5.6.2 Mobile, Portable and Low-Power Fixed Subscriber Equipment
The power of any emission outside the frequency range(s) in which the equipment operates shall be attenuated below the transmitter power, P(dBW), by the amount indicated in Table 2 and graphically represented in Figure 2, where p is the transmitter output power measured in watts.

According to Notice 2022-CEB001 In order to demonstrate compliance with the unwanted emission limit of -13 dBm/MHz, the power level measured within the first 1 MHz immediately adjacent to the channel edges shall be integrated over the full 1 MHz bandwidth with a resolution as close as possible to 1% (no less than 1%) of the occupied bandwidth.

TEST PROCEDURE

For Spectrum Emission Mask plots, the spectrum analyzer is configured to sweep with a moving integration window, the width of which can be adjusted to different sizes across the sweep. The window width is configured to be greater than or equal to the required reference bandwidth. The center frequencies of the integration window for the different integration windows was set such that the upper and lower edges of the windows are aligned with the transition points in the reference bandwidths. This is achieved by setting the start / stop frequencies of the window with an offset equal to the reference bandwidth / 2 from the transition point.

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

For each band edge measurement:

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

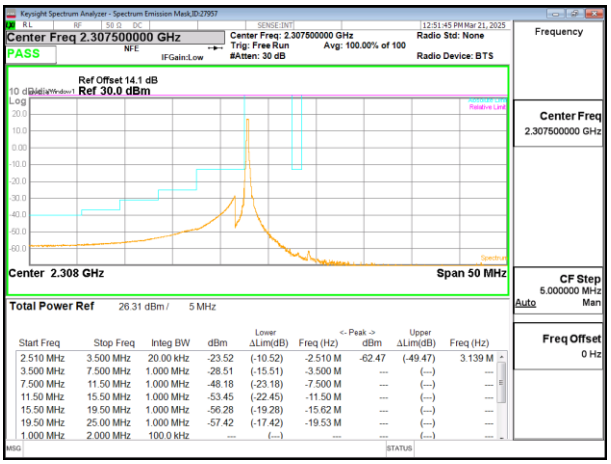
TEST PROCEDURE (BAND 30)

(5) Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the channel blocks at 2305, 2310, 2315, 2320, 2345, 2350, 2355, and 2360 MHz, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (*i.e.,* 1 MHz). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

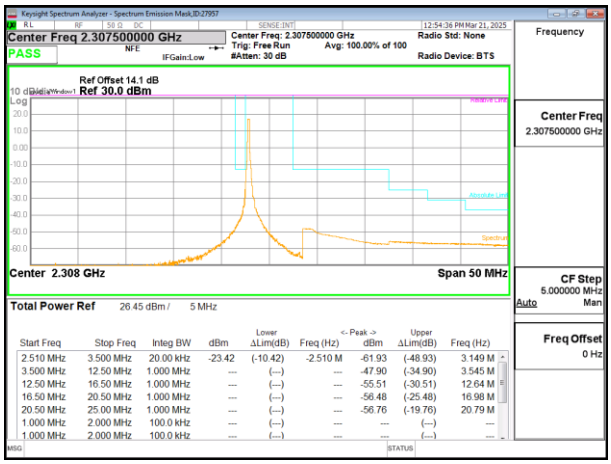
To show compliance with this requirement the spectrum analyzer is configured to measure the adjacent channel power for the frequency blocks adjacent to the channel edge. The integration of power is performed over a bandwidth > 1MHz and if the measurement is less than -13dBm when measured over more than 1MHz then the power must be less than -13dBm/MHz.

RESULTS

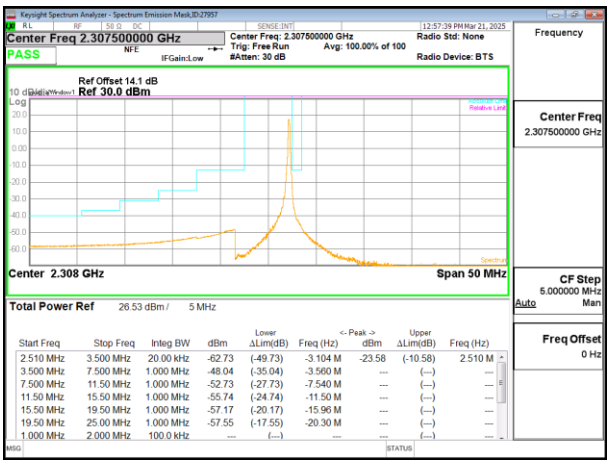
9.2.1. LTE BAND 30 EMISSION MASK



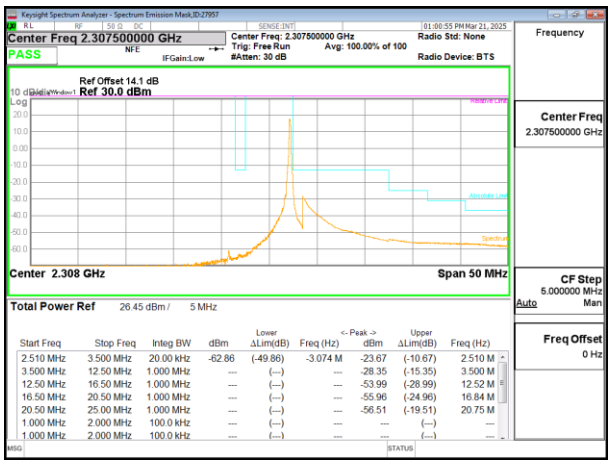
LTE B30 5MHz QPSK Low Channel RB1-0 (Low side)



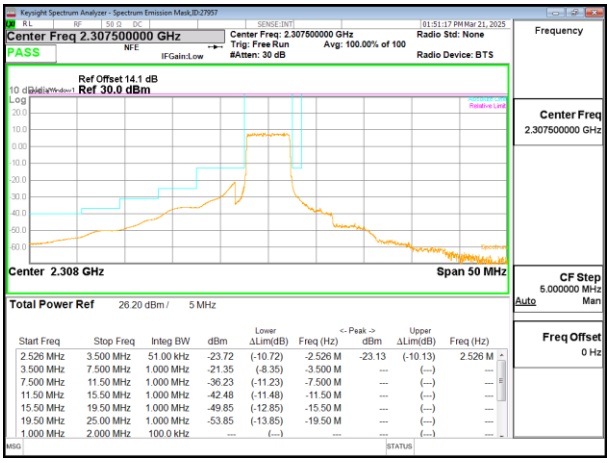
LTE B30 5MHz QPSK Low Channel RB1-0 (High side)



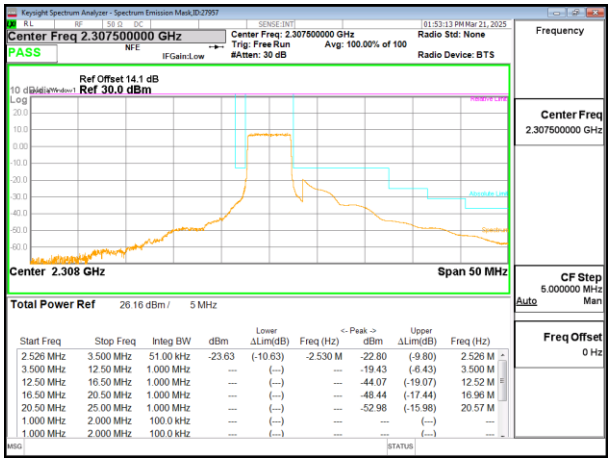
LTE B30 5MHz QPSK Low Channel RB1-24 (Low side)



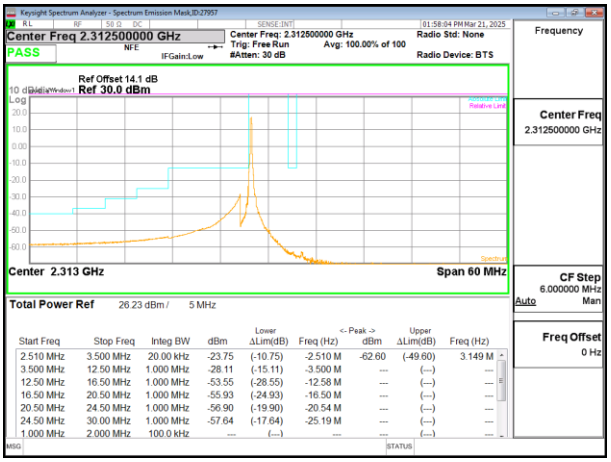
LTE B30 5MHz QPSK Low Channel RB1-24 (High side)



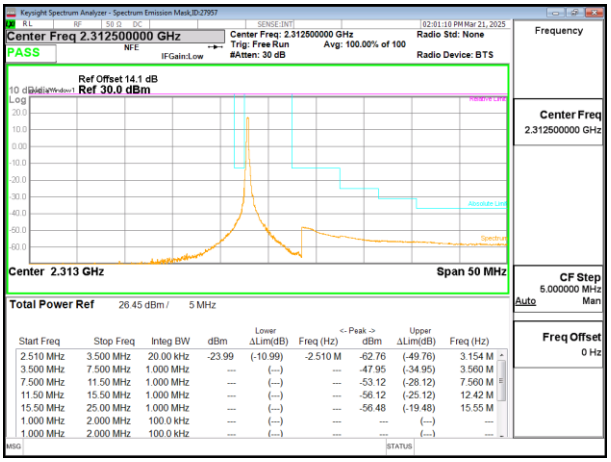
LTE B30 5MHz QPSK Low Channel RB25-0 (Low side)



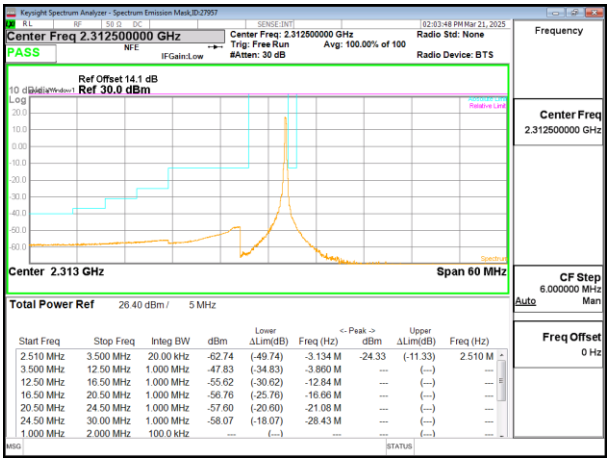
LTE B30 5MHz QPSK Low Channel RB25-0 (High side)



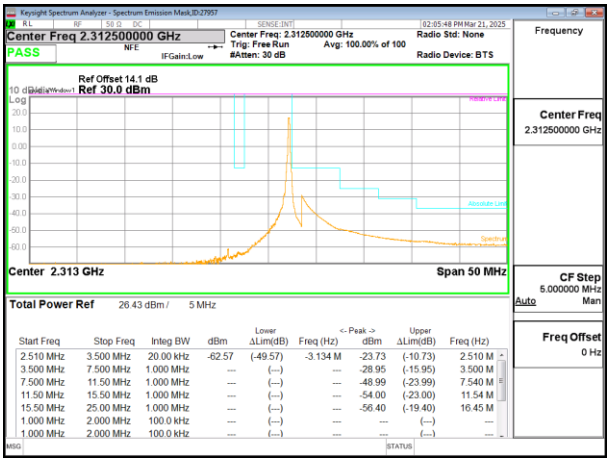
LTE B30 5MHz QPSK High Channel RB1-0 (Low side)



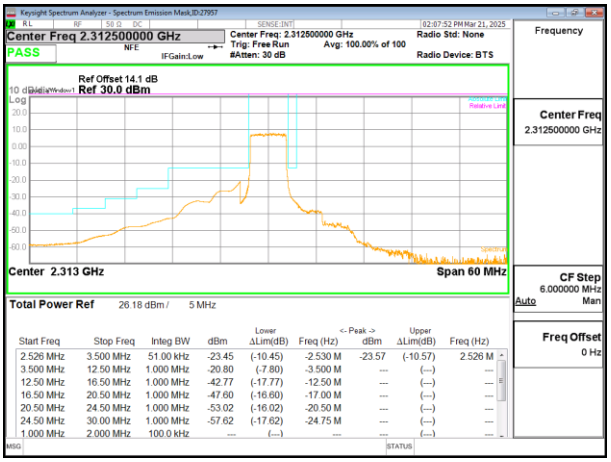
LTE B30 5MHz QPSK High Channel RB1-0 (High side)



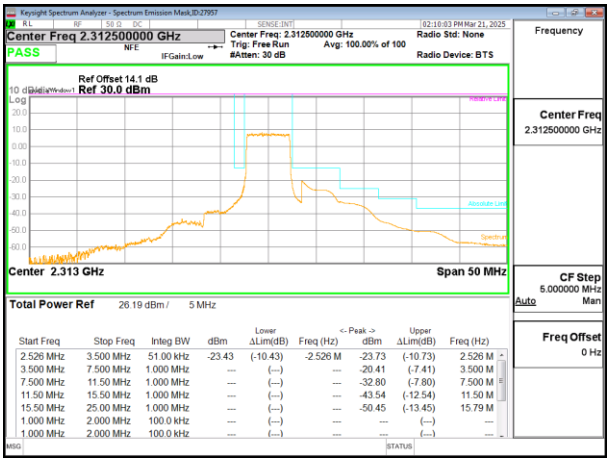
LTE B30 5MHz QPSK High Channel RB1-24 (Low side)



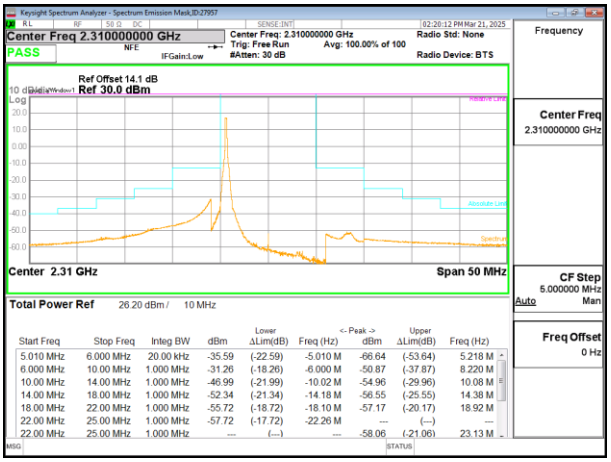
LTE B30 5MHz QPSK High Channel RB1-24 (High side)



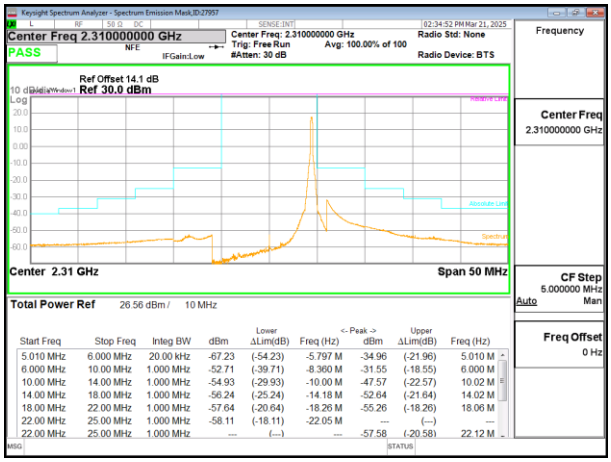
LTE B30 5MHz QPSK High Channel RB25-0 (Low side)



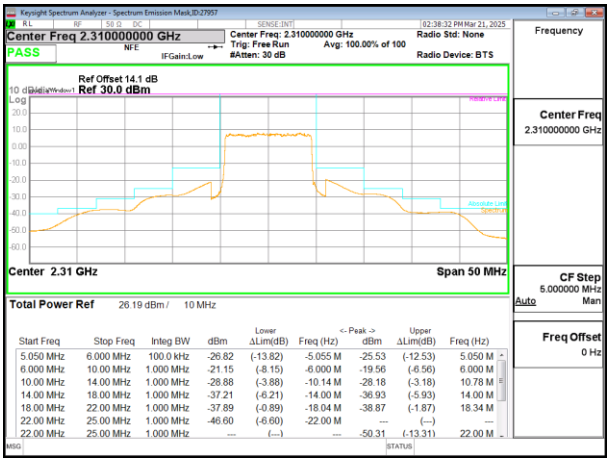
LTE B30 5MHz QPSK High Channel RB25-0 (High side)



LTE B30 10MHz QPSK Middle Channel RB1-0



LTE B30 10MHz QPSK Middle Channel RB1-49



LTE B30 10MHz QPSK Middle Channel RB50-0

Intentionally Blank

9.2.2. LTE BAND 30 ADJACENT CHANNEL POWER

LTE B30 5MHz QPSK Low Channel RB1-0

LTE B30 5MHz QPSK Middle Channel RB1-0

LTE B30 5MHz QPSK Low Channel RB1-24

LTE B30 MHz QPSK Middle Channel RB1-24

LTE B30 5MHz QPSK Low Channel RB25-0

LTE B30 5MHz QPSK Middle Channel RB25-0

LTE B30 5MHz QPSK High Channel RB1-0

LTE B30 10MHz QPSK Middle Channel RB1-0

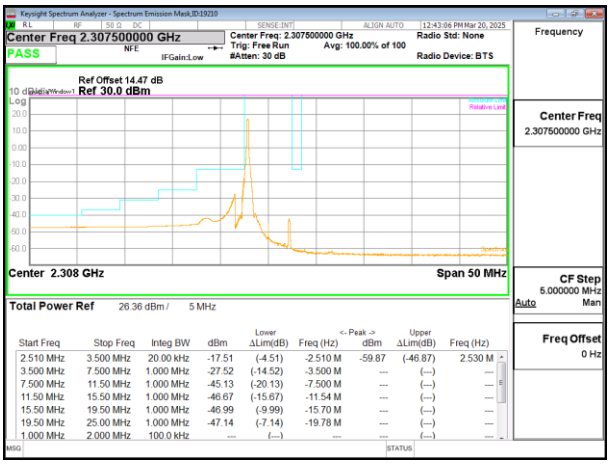
LTE B30 5MHz QPSK High Channel RB1-24

LTE B30 10MHz QPSK Middle Channel RB1-49

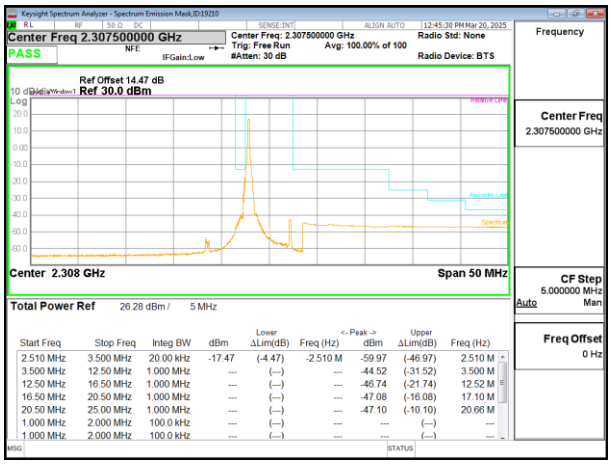
LTE B30 5MHz QPSK High Channel RB25-0

LTE B30 10MHz QPSK Middle Channel RB50-0

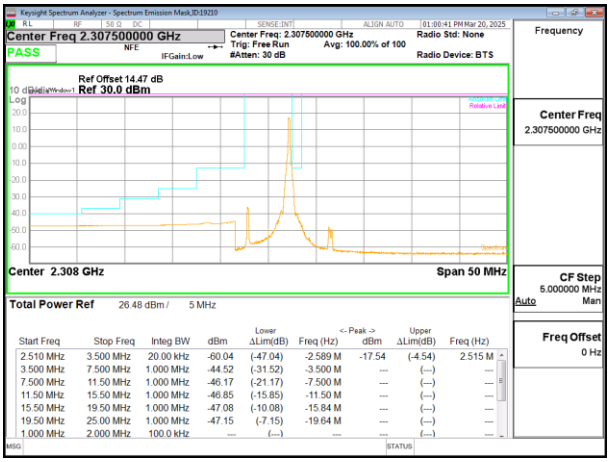
9.2.3. 5G NR n30 EMISSION MASK



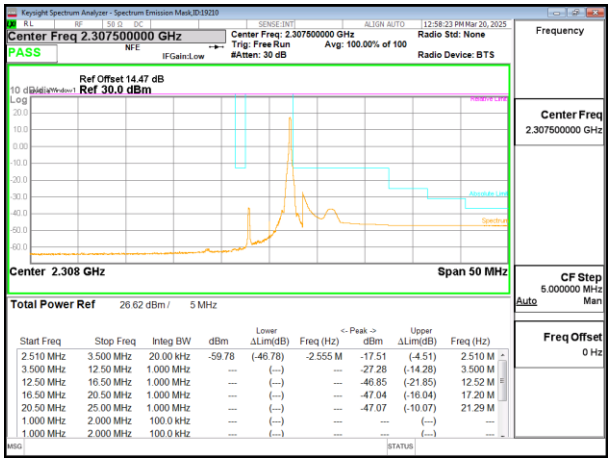
5G NR n30 5MHz BPSK Low Channel RB1-0 (Low side)



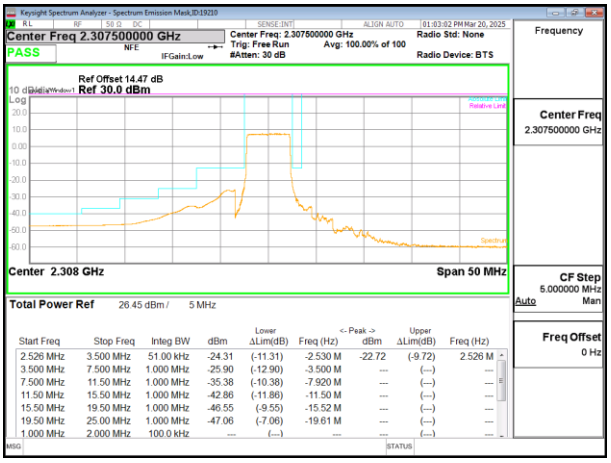
5G NR n30 5MHz BPSK Low Channel RB1-0 (High side)



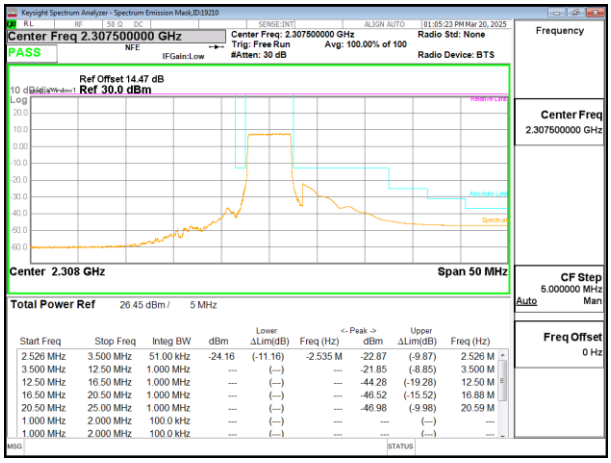
5G NR n30 5MHz BPSK Low Channel RB1-24 (Low side)



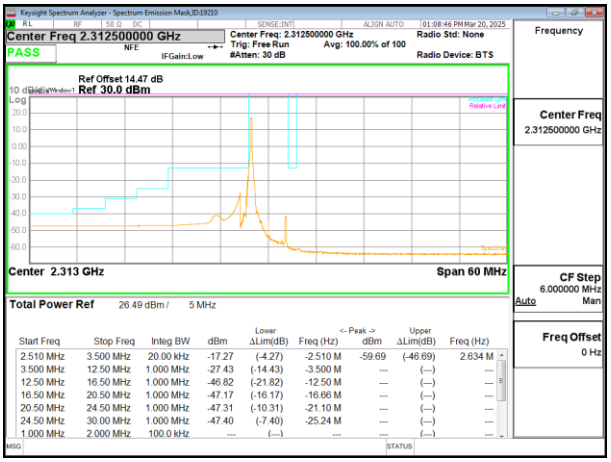
5G NR n30 5MHz BPSK Low Channel RB1-24 (High side)



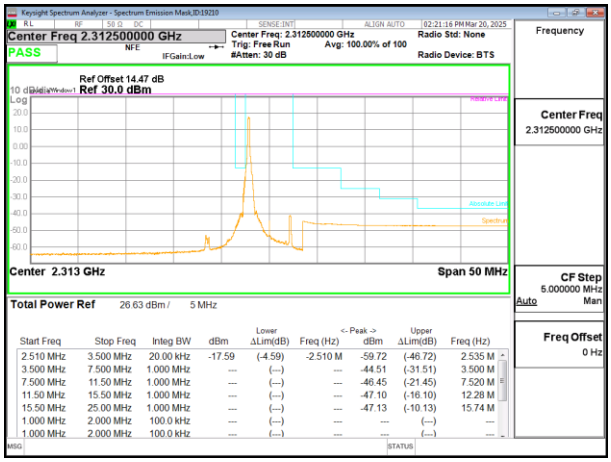
5G NR n30 5MHz BPSK Low Channel RB25-0 (Low side)



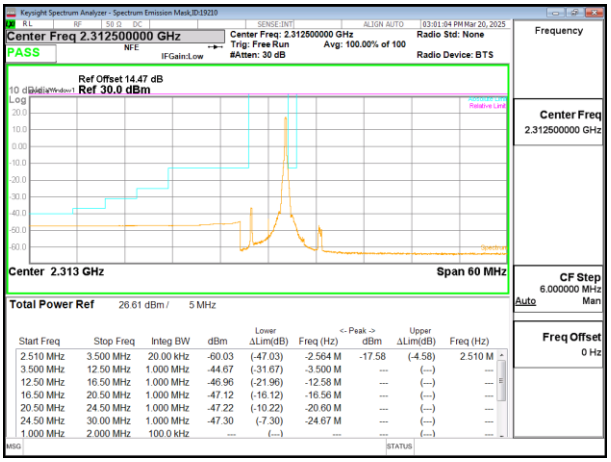
5G NR n30 5MHz BPSK Low Channel RB25-0 (High side)



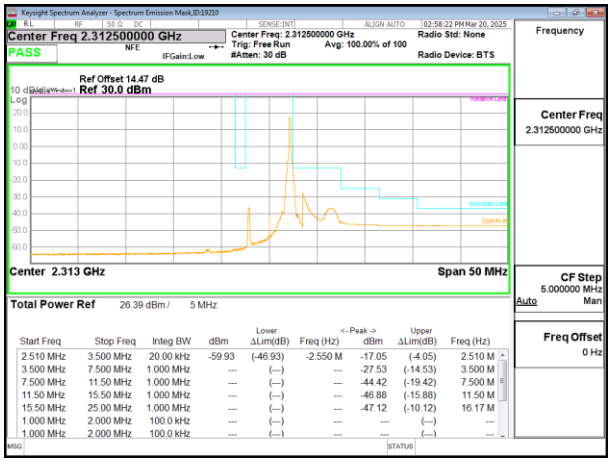
5G NR n30 5MHz BPSK High Channel RB1-0 (Low side)



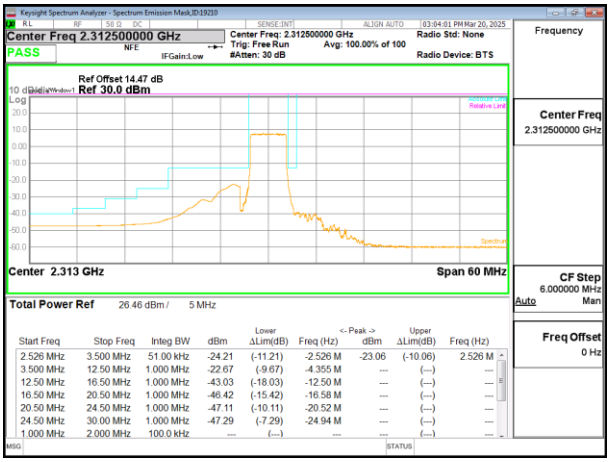
5G NR n30 5MHz BPSK High Channel RB1-0 (High side)



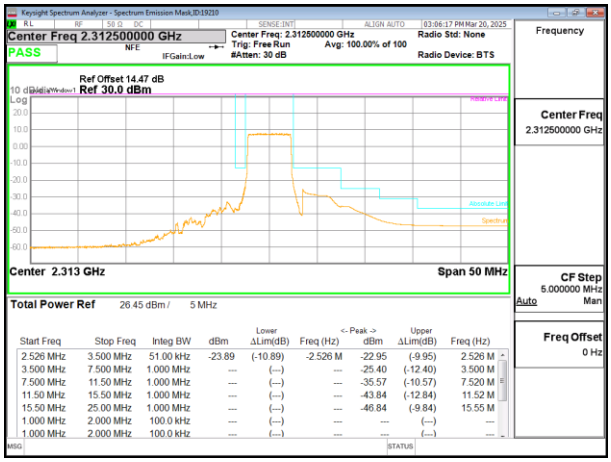
5G NR n30 5MHz BPSK High Channel RB1-24 (Low side)



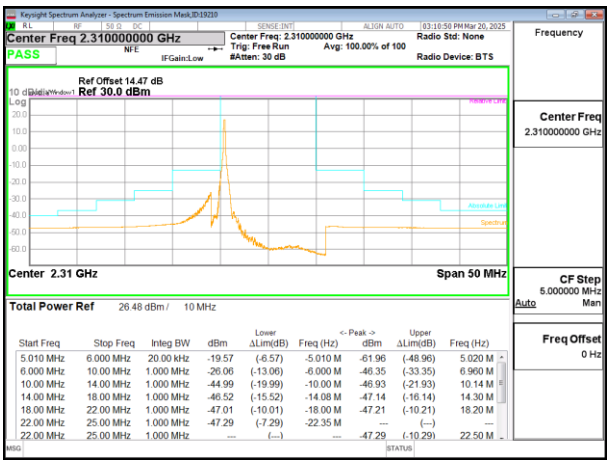
5G NR n30 5MHz BPSK High Channel RB1-24 (High side)



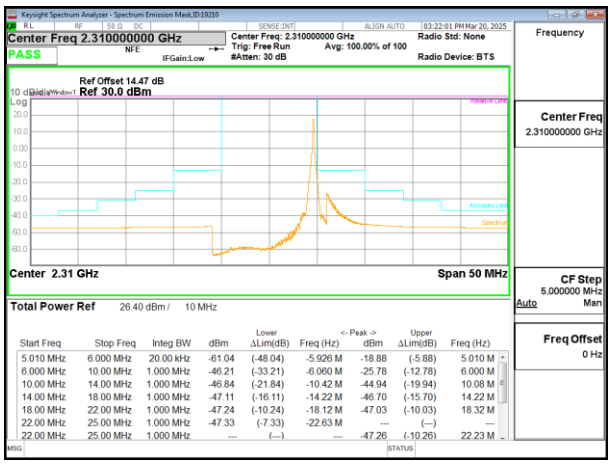
5G NR n30 5MHz BPSK High Channel RB25-0 (Low side)



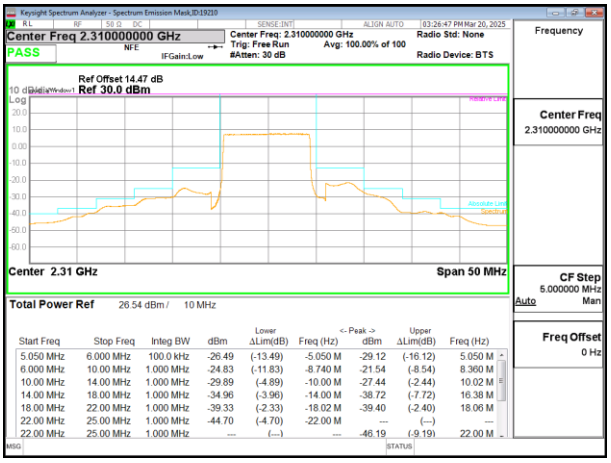
5G NR n30 5MHz BPSK High Channel RB25-0 (High side)



5G NR n30 10MHz BPSK Middle Channel RB1-0



5G NR n30 10MHz BPSK Middle Channel RB1-51



5G NR n30 10MHz BPSK Middle Channel RB50-0

Intentionally Blank

9.2.4. 5G NR n30 ADJACENT CHANNEL POWER

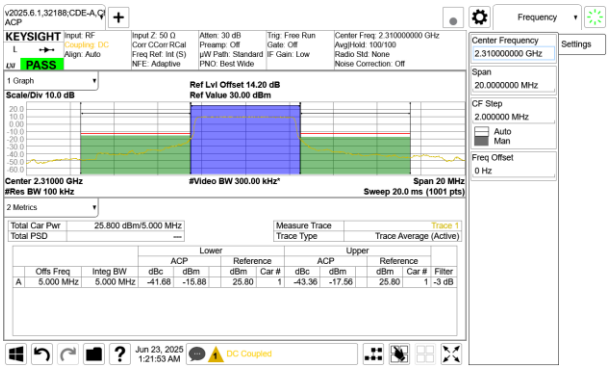
5G NR n30 5MHz BPSK Low Channel RB1-0

5G NR n30 5MHz BPSK Middle Channel RB1-0

5G NR n30 5MHz BPSK Low Channel RB1-24

5G NR n30 5MHz BPSK Middle Channel RB1-24

5G NR n30 5MHz BPSK Low Channel RB25-0



5G NR n30 5MHz BPSK Middle Channel RB25-0

5G NR n30 5MHz BPSK High Channel RB1-0

5G NR n30 10MHz BPSK Middle Channel RB1-0

5G NR n30 5MHz BPSK High Channel RB1-24

5G NR n30 10MHz BPSK Middle Channel RB1-51

5G NR n30 5MHz BPSK High Channel RB25-0

5G NR n30 10MHz BPSK Middle Channel RB50-0

9.3. OUT OF BAND EMISSIONS

LIMITS

FCC: §27.53 (a)
The minimum permissible attenuation level of any spurious emissions is 70 + 10 log (P) dB where transmitting power (P) in Watts.

RSS195§5.6.2
The minimum permissible attenuation level of any spurious emissions is 70 + 10 log (P) dB where transmitting power (P) in Watts.

TEST PROCEDURE

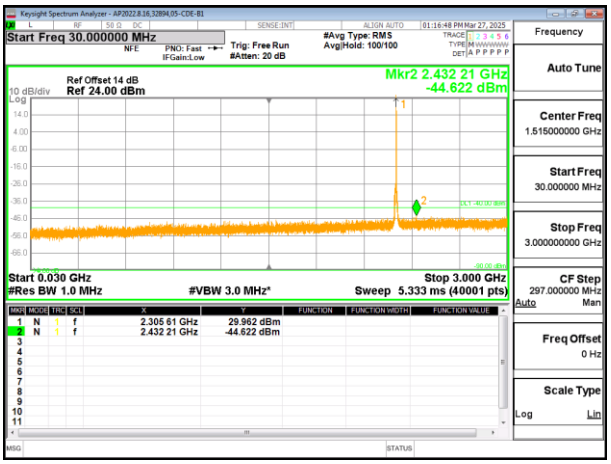
The RF output of the transmitter was connected to a spectrum analyzer through a calibrated coaxial cable. Sufficient scans were taken to show the out-of-band Emissions, if any, up to 10th harmonic. Multiple sweeps were recorded in maximum hold mode using a peak detector to ensure that the worst-case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

For each out of band emissions measurement:

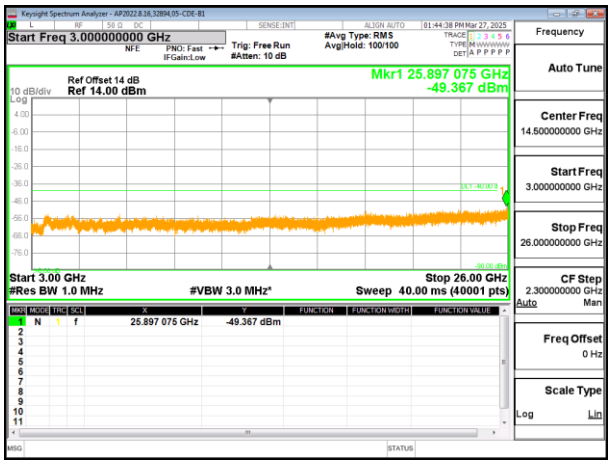
- Set display line at required limit.
- Set RBW & VBW to 100 kHz for the measurement below 1 GHz, and 1 MHz for the measurement above 1 GHz. (NOTE: Worst case set RBW/VBW to 1MHz/3MHz)

RESULTS

9.3.1. LTE BAND 30

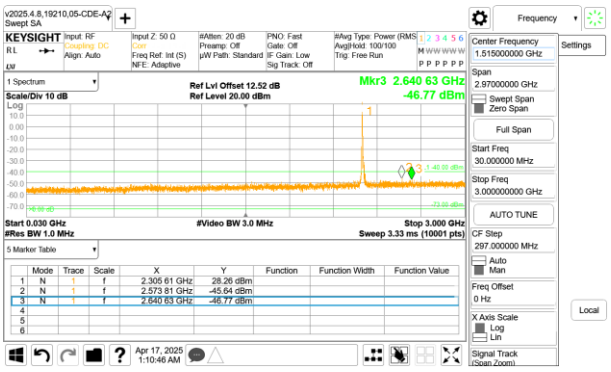


LTE B30 10MHz QPSK Mid Channel RB1-0 (30MHz to 3GHz)

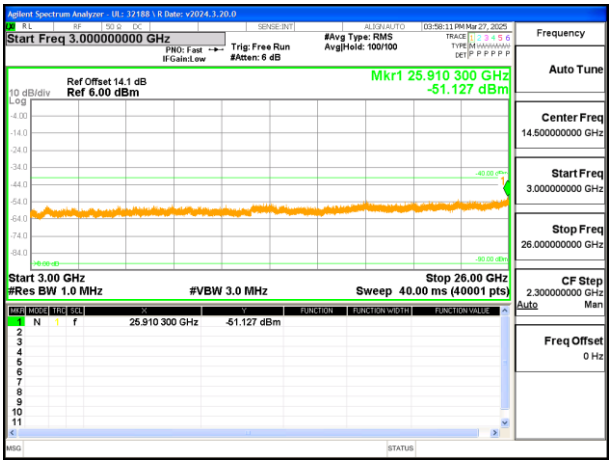


LTE B30 10MHz QPSK Middle Channel RB1-0 (3G to 26G)

9.3.2. 5G NR n30



5G NR n30 10MHz BPSK Middle Channel RB1-0 (30MHz to 3GHz)



5G NR n30 10MHz BPSK Middle Channel RB1-0 (3HHz to 30GHz)

9.4. FREQUENCY STABILITY

LIMITS

FCC: §27.54
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

ISED: RSS195§5.4
The applicant shall ensure frequency stability by showing that the occupied bandwidth is maintained within the range of the operating frequency blocks when testing under the temperature and supply voltage variations specified for the frequency stability measurement in RSS-Gen.

TEST PROCEDURE

Use base station simulator with Frequency Error measurement capability.

- Temp. = −30°C to +50°C
- Voltage = (85% - 115%)

  Low voltage, 3.23VDC, Normal, 3.8VDC and High voltage, 4.37VDC.
  End Voltage, 3.2VDC.

Frequency Stability vs Temperature:
The EUT is place inside a temperature chamber. The temperature is set to 20ºC and allowed to stabilize. After sufficient soak time, the transmitting frequency error is measured. The temperature is increased by 10 degrees, allowed to stabilize and soak, and then the measurement is repeated. This is repeated until +50ºC is reached.

Frequency Stability vs Voltage:
The peak frequency error is recorded (worst-case).

RESULTS

See the following pages.

UL VERIFICATION SERVICES INC.
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888

9.4.1. LTE BAND 30 (QPSK 10MHz BANDWIDTH)

Test Engineer ID:	27700	Test Date:	2025-03-04

Band	30	Frequency Range		Frequency Error Reading (Hz)	Limit	
Condition		2305	2315			
		Freq Reading @ Low End (MHz)	Freq Reading @ High End (MHz)		Frequency Stability (ppm)	Within Authorized Frequency Block (Hz)
Temperature	Voltage					
Normal (20°C)	Normal	2305.5246	2314.4755			
Extreme (50°C)		2305.5246	2314.4755	-1.7	-0.001	Yes
Extreme (40°C)		2305.5246	2314.4755	-1.6	-0.001	Yes
Extreme (30°C)		2305.5246	2314.4755	0.6	0.000	Yes
Extreme (10°C)		2305.5246	2314.4755	-0.7	0.000	Yes
Extreme (0°C)		2305.5246	2314.4755	-1.0	0.000	Yes
Extreme (-10°C)		2305.5246	2314.4755	0.4	0.000	Yes
Extreme (-20°C)		2305.5246	2314.4755	-0.3	0.000	Yes
Extreme (-30°C)		2305.5246	2314.4755	1.6	0.001	Yes
20°C	15%	2305.5246	2314.4755	-0.2	0.000	Yes
	-15%	2305.5246	2314.4755	3.0	0.001	Yes
	End Point Voltage	2305.5246	2314.4755	-0.7	0.000	Yes

9.4.2. 5G NR n30 (BPSK 10MHz BANDWIDTH)

Test Engineer ID:	27700	Test Date:	2025-03-31

Band	30	Frequency Range		Frequency Error Reading (Hz)	Limit	
Condition		2305	2315			
		Freq Reading @ Low End (MHz)	Freq Reading @ High End (MHz)		Frequency Stability (ppm)	Within Authorized Frequency Block (Hz)
Temperature	Voltage					
Normal (20°C)	Normal	2305.0930	2314.5450			
Extreme (50°C)		2305.0930	2314.5450	-8.9	-0.004	Yes
Extreme (40°C)		2305.0930	2314.5450	-7.91	-0.003	Yes
Extreme (30°C)		2305.0930	2314.5450	0.38	0.000	Yes
Extreme (10°C)		2305.0930	2314.5450	-7.43	-0.003	Yes
Extreme (0°C)		2305.0930	2314.5450	-2.16	-0.001	Yes
Extreme (-10°C)		2305.0930	2314.5450	-5.91	-0.003	Yes
Extreme (-20°C)		2305.0930	2314.5450	-1.24	-0.001	Yes
Extreme (-30°C)		2305.0930	2314.5450	-5.33	-0.002	Yes
20°C	15%	2305.0930	2314.5450	-7.79	-0.003	Yes
	-15%	2305.0930	2314.5450	-4.6	-0.002	Yes
	End Point Voltage	2305.0930	2314.5450	-6.79	-0.003	Yes

9.5. PEAK-TO-AVERAGE POWER RATIO

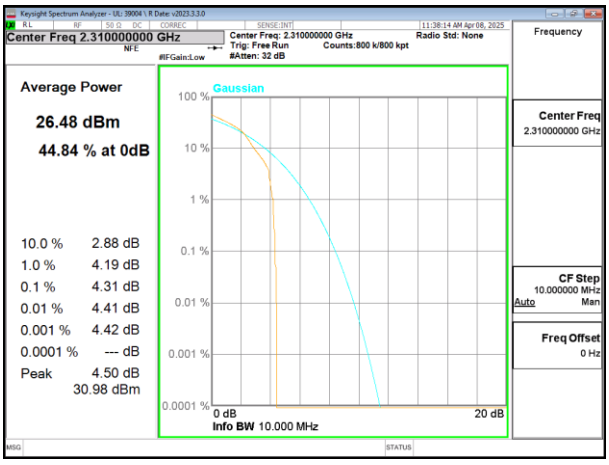
LIMIT

In addition, the peak-to-average power ratio (PAPR) of the transmitter shall not exceed 13 dB for more than 0.1% of the time and shall use a signal corresponding to the highest PAPR during periods of continuous transmission.

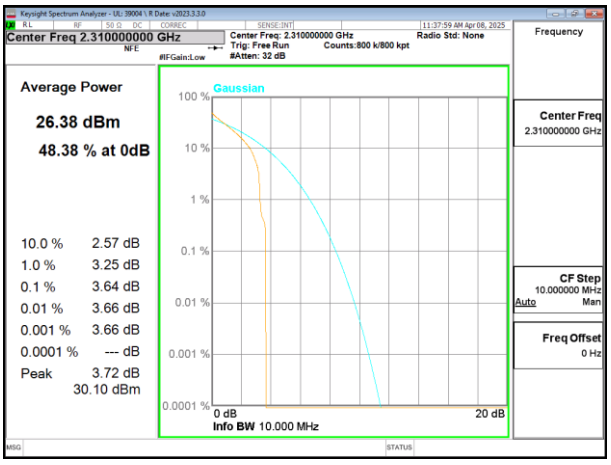
RESULT

Antenna 3 was used to measure as the worst case; full resource block (FRB) for each bandwidth was used to measure as the worst case. The results from all CCDF measurements are passed with 13dB peak-to-average power ratio criteria.

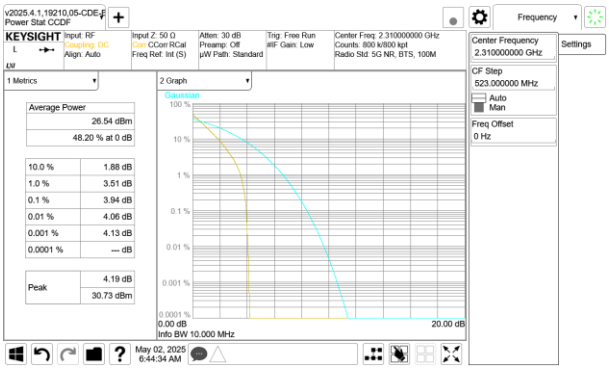
Example Plots: FULL RB



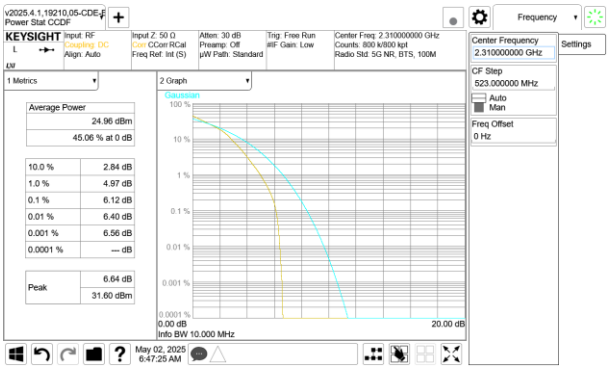
LTE B30 10MHz QPSK Middle Channel



LTE B30 10MHz 16QAM Middle Channel



5G NR n30 10MHz BPSK Middle Channel



5G NR n30 10MHz 16QAM Middle Channel

9.5.1. LTE BAND 30

Test Engineer ID:	39004	Test Date:	2025-04-08

Band	Bandwidth (MHz)	Frequency (MHz)	RB Allocation	RB OffSet	Modulation	Conducted Power (dBm)		Peak-to-Average Power Ratio (dB)
						Peak	Average	
LTE Band 30	5MHz	2310.0	25	0	QPSK	31.19	26.56	4.63
					16QAM	30.31	26.42	3.89
	10MHz		50	0	QPSK	30.98	26.48	4.50
					16QAM	30.10	26.38	3.72
Duty Cycle Correction Factor (dB) =			0.00					
Peak-to-Average Power Ratio= Peak Reading - Average Reading - Duty Cycle Correction Factor								

9.5.2. 5G NR n30

Test Engineer ID:	19210	Test Date:	2025-05-01

Band	Bandwidth (MHz)	Frequency (MHz)	RB Allocation	RB OffSet	Modulation	Conducted Power (dBm)		Peak-to-Average Power Ratio (dB)
						Peak	Average	
5G NR n30	5MHz	2310.0	25	0	BPSK	30.92	26.62	4.30
					16QAM	31.58	24.92	6.66
	10MHz		50	0	BPSK	30.73	26.54	4.19
					16QAM	31.60	24.96	6.64
Duty Cycle Correction Factor (dB) =			0.00					
Peak-to-Average Power Ratio= Peak Reading - Average Reading - Duty Cycle Correction Factor								

10. RADIATED TEST RESULTS

LIMITS

FCC: §27.53 (a)
For mobile and portable stations operating in the 2305-2315 MHz: by a factor of not less than 43 + 10 log (P) dB on all frequencies between 2360 and 2365 MHz, and not less than 70 + 10 log (P) dB above 2365 MHz.

RSS195§5.6
The transmitter unwanted emissions shall be measured with a resolution bandwidth of 1 MHz. A smaller resolution bandwidth is permitted provided that the measured power is integrated over the full required measurement bandwidth of 1 MHz. However, in the 1 MHz bands immediately adjacent to the edges of the frequency range(s) in which the equipment is allowed to operate, a resolution bandwidth of as close as possible to, without being less than 1% of the occupied bandwidth, shall be employed provided that the measured power is integrated over the full required measurement bandwidth of 1 MHz.

RSS195§5.6.2 Mobile, Portable and Low-Power Fixed Subscriber Equipment
The power of any emission outside the frequency range(s) in which the equipment operates shall be attenuated below the transmitter power, P(dBW), by the amount indicated in Table 2 and graphically represented in Figure 2, where p is the transmitter output power measured in watts.

UL VERIFICATION SERVICES INC.
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888

Radiated measurement using the Field Strength Method

Using the test configuration shown in Figure 6 below, the radiated emissions is measured directly from the EUT and convert the measured field strength or received power to ERP or EIRP, as required, for comparison to the applicable limits. As stated in 5.5.1 of ANSI C63.26-2015, the field strength measurement method using a test site validated to the requirements of ANSI C63.4 is an alternative to the substitution measurement.

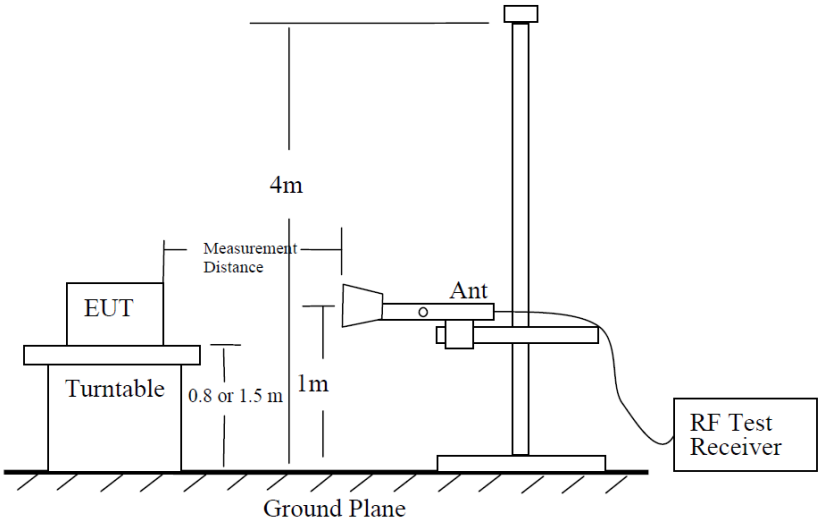


Figure 6—Test site-up for radiated ERP and/or EIRP measurements

Radiated Power Measurement Calculation According to ANSI C63.26-2015

a) E (dBµV/m) = Measured amplitude level (dBµV) + Cable Loss (dB) + Antenna Factor (dB/m).
b) E (dBµV/m) = Measured amplitude level (dBm) + 107 + Cable Loss (dB) + Antenna Factor (dB/m).
c) E (dBµV/m) = EIRP (dBm) − 20log(D) + 104.8; where D is the measurement distance (in the far field region) in m.
d) EIRP (dBm) = E (dBµV/m) + 20log(D) − 104.8; where D is the measurement distance (in the far field region) in m.

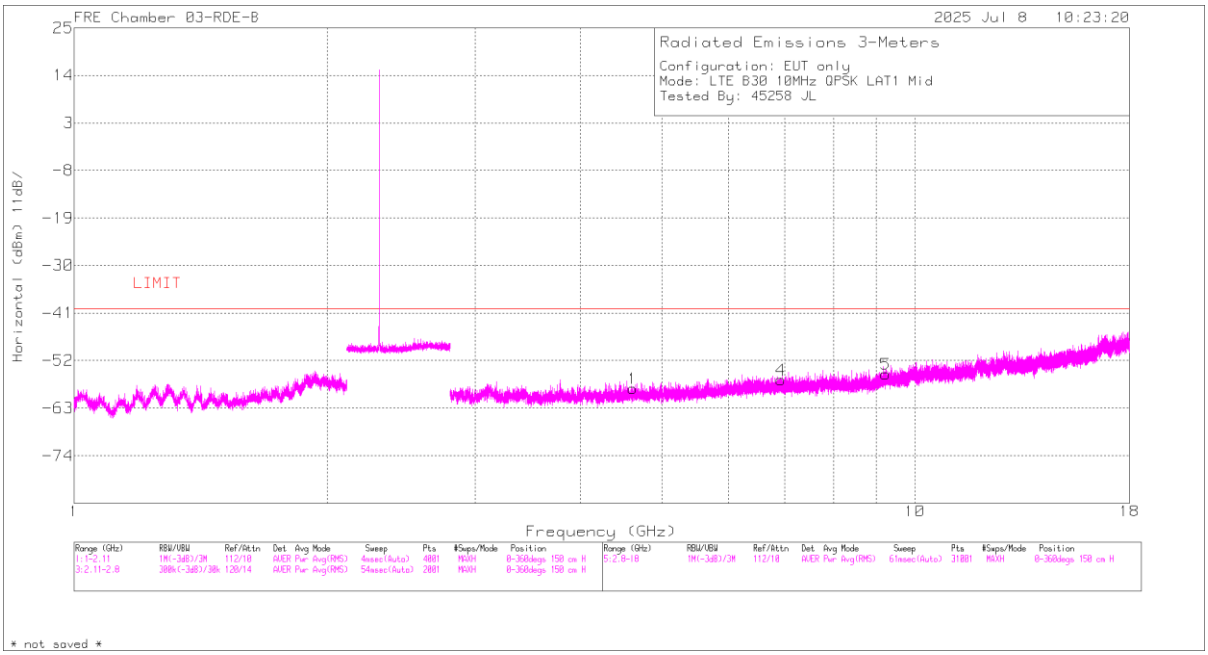
So, from d)

The measuring distance is usually at 3m, then 20*Log(3)=9.5424

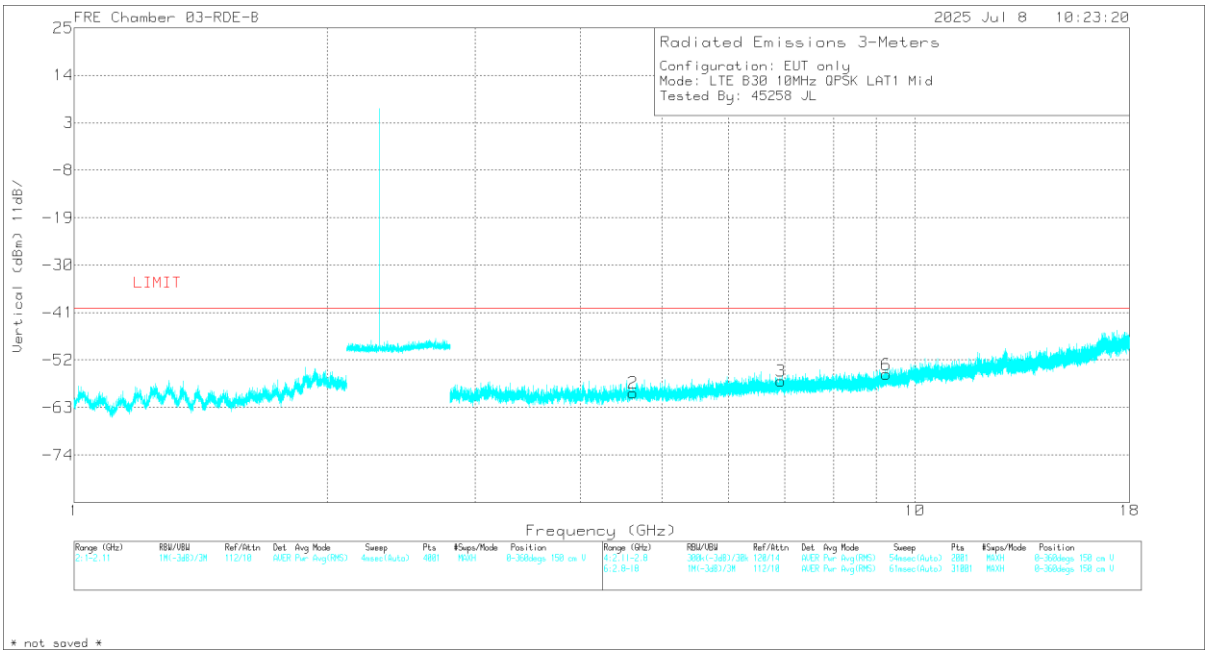
Then, EIRP (dBm) = E (dBµV/m) + 9.5424 − 104.8 = E (dBµV/m) – 95.2576

Note: Confidence check of each chamber is performed daily to see if any degradation from expected/normal reading reference data. Ambient check of each chamber is performed monthly.

Example Plot



Horizontal Polarity



Vertical Polarity

Trace Markers

Frequency (GHz)	Meter Reading (dBuV)	Det	223084 ACF (dB/m)	EIRP CF	Gain/Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)	Polarity
Mid Channel, 2310MHz									
4.617627	51.84	RMS	33.8	-95.2	-48.97	-58.53	-40	-18.53	H
4.620079	50.77	RMS	33.8	-95.2	-49.02	-59.65	-40	-19.65	V
6.929991	50.30	RMS	35.6	-95.2	-47.20	-56.50	-40	-16.50	H
6.930971	49.96	RMS	35.6	-95.2	-47.20	-56.84	-40	-16.84	V
9.236470	50.17	RMS	36.4	-95.2	-46.55	-55.18	-40	-15.18	H
9.240393	49.90	RMS	36.4	-95.2	-46.44	-55.34	-40	-15.34	V

10.1. FIELD STRENGTH OF SPURIOUS RADIATION, ABOVE 1GHz

TEST PROCEDURE

KDB 971168 D01 /D02

All tests above 1GHz were done with a Resolution Bandwidth of 1MHz, and a Video Bandwidth of 3MHz

RESULTS

10.1.1. LTE BAND 30

LTE BAND 30 (QPSK 10.0MHZ BANDWIDTH, ANT 3)

Date:	2025-07-08
Test Engineer:	45258
Configuration:	EUT Only
Mode:	LTE B30 10MHz QPSK
Chamber #:	03-RDE-B

Frequency (GHz)	Meter Reading (dBuV)	Det	223084 ACF (dB/m)	EIRP CF	Gain/Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)	Polarity
Mid Channel, 2310MHz									
4.617627	51.84	RMS	33.8	-95.2	-48.97	-58.53	-40	-18.53	H
4.620079	50.77	RMS	33.8	-95.2	-49.02	-59.65	-40	-19.65	V
6.929991	50.30	RMS	35.6	-95.2	-47.20	-56.50	-40	-16.50	H
6.930971	49.96	RMS	35.6	-95.2	-47.20	-56.84	-40	-16.84	V
9.236470	50.17	RMS	36.4	-95.2	-46.55	-55.18	-40	-15.18	H
9.240393	49.90	RMS	36.4	-95.2	-46.44	-55.34	-40	-15.34	V

LTE BAND 30 (QPSK 10.0MHZ BANDWIDTH, ANT 4)

Date:	2025-07-08
Test Engineer:	45258
Configuration:	EUT Only
Mode:	LTE B30 10MHz QPSK
Chamber #:	03-RDE-B

Frequency (GHz)	Meter Reading (dBuV)	Det	223084 ACF (dB/m)	EIRP CF	Gain/Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)	Polarity
Mid Channel, 2310MHz									
4.620079	51.47	RMS	33.8	-95.2	-49.02	-58.95	-40	-18.95	H
4.621550	52.13	RMS	33.9	-95.2	-49.20	-58.37	-40	-18.37	V
6.929991	49.78	RMS	35.6	-95.2	-47.20	-57.02	-40	-17.02	H
6.930481	49.96	RMS	35.6	-95.2	-47.20	-56.84	-40	-16.84	V
9.240393	50.04	RMS	36.4	-95.2	-46.44	-55.20	-40	-15.20	H
9.240393	49.33	RMS	36.4	-95.2	-46.44	-55.91	-40	-15.91	V

LTE BAND 30 (QPSK 10.0MHZ BANDWIDTH, ANT 2)

Date:	2025-07-08
Test Engineer:	45258
Configuration:	EUT Only
Mode:	LTE B30 10MHz QPSK
Chamber #:	03-RDE-B

Frequency (GHz)	Meter Reading (dBuV)	Det	223084 ACF (dB/m)	EIRP CF	Gain/Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)	Polarity
Mid Channel, 2310MHz									
4.620569	51.33	RMS	33.8	-95.2	-49.11	-59.18	-40	-19.18	H
4.619098	51.67	RMS	33.8	-95.2	-49.09	-58.82	-40	-18.82	V
6.930481	49.60	RMS	35.6	-95.2	-47.20	-57.20	-40	-17.20	H
6.931462	49.24	RMS	35.6	-95.2	-47.25	-57.61	-40	-17.61	V
9.241864	50.63	RMS	36.4	-95.2	-46.5	-54.67	-40	-14.67	H
9.240393	49.98	RMS	36.4	-95.2	-46.44	-55.26	-40	-15.26	V

LTE BAND 30 (QPSK 10.0MHZ BANDWIDTH, ANT 1)

Date:	2025-07-08
Test Engineer:	45258
Configuration:	EUT Only
Mode:	LTE B30 10MHz QPSK
Chamber #:	03-RDE-B

Frequency (GHz)	Meter Reading (dBuV)	Det	223084 ACF (dB/m)	EIRP CF	Gain/Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)	Polarity
Mid Channel, 2310MHz									
4.624002	51.69	RMS	33.9	-95.2	-49.1	-58.71	-40	-18.71	H
4.620079	51.50	RMS	33.8	-95.2	-49.02	-58.92	-40	-18.92	V
6.930971	51.49	RMS	35.6	-95.2	-47.2	-55.31	-40	-15.31	H
6.931462	49.59	RMS	35.6	-95.2	-47.25	-57.26	-40	-17.26	V
9.239412	50.07	RMS	36.4	-95.2	-46.46	-55.19	-40	-15.19	H
9.239902	50.22	RMS	36.4	-95.2	-46.41	-54.99	-40	-14.99	V

10.1.2. 5G NR n30

5G NR n30 (BPSK 10.0MHZ BANDWIDTH, ANT 3)

Date:	2025-07-08
Test Engineer:	45258
Configuration:	EUT Only
Mode:	5G NR N30 10MHz BPSK
Chamber #:	03-RDE-B

Frequency (GHz)	Meter Reading (dBuV)	Det	223084 ACF (dB/m)	EIRP CF	Gain/Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)	Polarity
Mid Channel 2310MHz									
4.621060	52.98	RMS	33.8	-95.2	-49.2	-57.62	-40	-17.62	H
4.622040	51.20	RMS	33.9	-95.2	-49.2	-59.30	-40	-19.30	V
6.932933	49.92	RMS	35.6	-95.2	-47.3	-56.98	-40	-16.98	H
6.928029	51.35	RMS	35.6	-95.2	-47.2	-55.45	-40	-15.45	V
9.238922	50.52	RMS	36.4	-95.2	-46.5	-54.78	-40	-14.78	H
9.243825	50.58	RMS	36.4	-95.2	-46.58	-54.80	-40	-14.80	V

5G NR n30 (BPSK 10.0MHZ BANDWIDTH, ANT 4)

Date:	2025-07-08
Test Engineer:	45258
Configuration:	EUT Only
Mode:	5G NR N30 10MHz BPSK
Chamber #:	03-RDE-B

Frequency (MHz)	Meter Reading (dBuV)	Det	223084 ACF (dB/m)	EIRP CF	Gain/Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)	Polarity
Mid Channel,2310MHz									
4.620079	52.21	RMS	33.8	-95.2	-49.02	-58.21	-40	-18.21	H
4.622040	51.42	RMS	33.9	-95.2	-49.2	-59.08	-40	-19.08	V
6.925578	50.34	RMS	35.6	-95.2	-47.2	-56.46	-40	-16.46	H
6.929010	49.66	RMS	35.6	-95.2	-47.3	-57.24	-40	-17.24	V
9.239412	49.46	RMS	36.4	-95.2	-46.46	-55.80	-40	-15.80	H
9.239412	49.74	RMS	36.4	-95.2	-46.46	-55.52	-40	-15.52	V

5G NR n30 (BPSK 10.0MHZ BANDWIDTH, ANT 2)

Date:	2025-07-08
Test Engineer:	45258
Configuration:	EUT Only
Mode:	5G NR N30 10MHz BPSK
Chamber #:	03-RDE-B

Frequency (MHz)	Meter Reading (dBuV)	Det	223084 ACF (dB/m)	EIRP CF	Gain/Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)	Polarity
Mid Channel,2310MHz									
4.622040	52.19	RMS	33.9	-95.2	-49.2	-58.31	-40	-18.31	H
4.619098	52.16	RMS	33.8	-95.2	-49.09	-58.33	-40	-18.33	V
6.929010	50.76	RMS	35.6	-95.2	-47.3	-56.14	-40	-16.14	H
6.928520	50.02	RMS	35.6	-95.2	-47.25	-56.83	-40	-16.83	V
9.243825	50.17	RMS	36.4	-95.2	-46.58	-55.21	-40	-15.21	H
9.242354	49.74	RMS	36.4	-95.2	-46.50	-55.56	-40	-15.56	V

5G NR n30 (BPSK 10.0MHZ BANDWIDTH, ANT 1)

Date:	2025-07-08
Test Engineer:	45258
Configuration:	EUT Only
Mode:	5G NR N30 10MHz BPSK
Chamber #:	03-RDE-B

Frequency (MHz)	Meter Reading (dBuV)	Det	223084 ACF (dB/m)	EIRP CF	Gain/Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)	Polarity
Mid Channel,2310MHz									
4.622040	52.55	RMS	33.9	-95.2	-49.2	-57.95	-40	-17.95	H
4.620079	51.12	RMS	33.8	-95.2	-49.02	-59.30	-40	-19.30	V
6.929010	50.08	RMS	35.6	-95.2	-47.3	-56.82	-40	-16.82	H
6.929010	50.76	RMS	35.6	-95.2	-47.3	-56.14	-40	-16.14	V
9.246276	50.65	RMS	36.4	-95.2	-46.7	-54.85	-40	-14.85	H
9.242354	49.74	RMS	36.4	-95.2	-46.5	-55.56	-40	-15.56	V

11. SETUP PHOTOS

Refer to 15496249-EP1V1 for setup photos.

END OF REPORT

UL VERIFICATION SERVICES INC.
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888