

TEST REPORT

Report Number: 15496277-E28V2

Applicant : APPLE, INC.
1 APPLE PARK WAY
CUPERTINO, CA 95014, U.S.A.

Model : A3258

Brand : APPLE

FCC ID : BCG-E8947A

IC : 579C-E8947A

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:
2025-08-14

Prepared by:
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Revision History

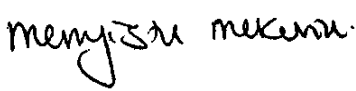

Rev.	Issue Date	Revisions	Revised By
V1	2025-08-01	Initial Review	--
V2	2025-08-14	Addressed TCB Feed Back. Updated section 6.5	Mengistu Mekuria, Michael Vang

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1. ATTESTATION OF TEST RESULTS.

Applicant Name and Address	APPLE, INC. 1 APPLE PARK WAY CUPERTINO, CA 95014, U.S.A.	
Model	A3258	
Brand	APPLE	
FCC ID	BCG-E8947A	
IC	579C-E8947A	
EUT Description	SMARTPHONE	
Serial Number	RADIATED: DQMWH1905G, GQQ7TY7JLY, J46VHKX6H, DMXG3RKJYV CONDUCTED: J6HHCW0001W0000WEZ, J6HHG2000FA0000WEZ, J6HHH50000V0000WEZ, J6HHCZ0000FP0000WEZ	
Sample Receipt Date	2024-11-21	
Date Tested	2024-11-21 to 2025-08-02	
Applicable Standards	FCC 47 CFR PART 2, PART 27 ISED RSS-GEN ISSUE 5 + A1 + A2, RSS-195 ISSUE 2	
Test Results	COMPLIES	
<p>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.</p> <p>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.</p> <p>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.</p>		
Approved & Released By:	Reviewed By:	Prepared By:
		
Mengistu Mekuria Staff Engineer UL Verification Services Inc.	Tewodros Woldemichael Laboratory Engineer UL Verification Services Inc.	Michael Vang Laboratory Engineer UL Verification Services Inc.

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	

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
<input type="checkbox"/>	Building 1: 47173 Benicia Street, Fremont, CA 94538, USA	US0104	2324A	550739
<input checked="" type="checkbox"/>	Building 2: 47266 Benicia Street, Fremont, CA 94538, USA			
<input checked="" type="checkbox"/>	Building 3: 843 Auburn Court, Fremont, CA 94538, USA			
<input type="checkbox"/>	Building 4: 47658 Kato Rd, Fremont, CA 94538, USA			
<input checked="" type="checkbox"/>	Building 5: 47670 Kato Rd, Fremont, CA 94538, USA			

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, 5G NR1, 5G NR2, 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

$$\text{ERP/EIRP} = \text{PMeas} + \text{GT} - \text{LC}$$

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:

LTE BAND 30

Part 27 / RSS 195									
EIRP Limit (W)		0.25							
Antenna Gain (dBi) (Ant 2)		0.00							
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	23.40	23.40	0.219	4.500	4500	4M50G7W
	16QAM			22.51	22.51	0.178	4.494	4494	4M49D7W
10.0	QPSK	2310.0	2310.0	23.40	23.40	0.219	8.984	8984	8M98G7W
	16QAM			22.42	22.32	0.171	9.008	9008	9M01D7W

5G NR n30

Part 27 / RSS 195									
EIRP Limit (W)		0.25							
Antenna Gain (dBi) (Ant 2)		0.00							
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	23.19	23.19	0.208	4.508	4508	4M51G7W
	QPSK			23.20	23.20	0.209	4.502	4502	4M50G7W
	16QAM			22.17	22.17	0.165	4.502	4502	4M50D7W
10.0	BPSK	2310.0	2310.0	23.20	23.20	0.209	8.947	8947	8M95G7W
	QPSK			23.17	23.17	0.207	8.925	8925	8M93G7W
	16QAM			22.14	22.14	0.164	8.970	8970	8M97D7W

6.3. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was version 0.8.0.0.

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	-2.60	25.7	23.10
		ANT2	0.00	23.4	23.40
		ANT3	-2.90	25.0	22.10
		ANT4	0.20	22.7	22.90
5G NR n30	2305 - 2315	ANT1	-2.60	25.2	22.60
		ANT2	0.00	23.2	23.20
		ANT3	-2.90	24.5	21.60
		ANT4	0.20	22.2	22.40

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 1

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	ANT1	ANT2	ANT3	ANT4
2300 – 2700 MHz	X	X	X	X

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 was utilized for the tests documented in this report:

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	Asset	Cal Due
Wideband Communication Test Set, Call Box	R&S GmbH & Co.	CMW500	85723	2026-02-28
Wideband Communication Test Set, Call Box	R&S GmbH & Co.	CMW500	230297	2026-02-28
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	169936	2026-02-28
Antenna, Horn 1-18GHz	ETS Lindgren	3117	200897	2026-04-30
RF Filter Box, 1-18GHz, 12 Port	UL-FR1	Frankenstein	217255	2026-01-31
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	223460	2026-02-28
RF Filter Box, 1-18GHz, 17 Port	UL-FR1	RATS 2	236726	2025-10-31
Antenna, Horn 1-18GHz	ETS Lindgren	3117	80403	2026-08-31
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
PXA Signal Analyzer	Keysight Technologies Inc	N9030B	259079	2026-02-28
PXA Signal Analyzer	Agilent Technologies Inc	N9030A	87738	2026-01-16
UXM 5G Wireless Test Platform	Keysight Technologies Inc	E7515B	MY59020604	2026-02-26
Wideband Communication Test Set, Call Box	Rohde & Schwarz	CMW500	230298	2026-02-28
Wideband Communication Test Set, Call Box	Rohde & Schwarz	CMW500	222793	2026-02-28
Conducted Switch Box	N/A	CSB	227264	2026-03-31
Conducted Switch Box	N/A	CSB	262286	2026-04-30
Conducted Switch Box	N/A	CSB	262288	2026-04-30
Conducted Switch Box	N/A	CSB	263817	2026-05-31
Filter, BRF 3400-3800MHz, 18GHz max	Micro-Tronics	BRM50711	217364	2025-09-30
Filter, BRF 2305-2315	Micro-Tronics	BRC20553	224186	2026-06-29
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
Chamber, Environmental	Cincinnati Sub Zero	ZPHS-8-3.5-SCT/WC	82472	2025-08-31
UL AUTOMATION SOFTWARE				
Conducted Software	UL	CLT	Ver.2023.11.21.0 & .2024.3.20.0 & 2022.7.6.0 & 2023.6.21	
Conducted Software	UL	Power Measurement	Ver.2023.8.14 & 2022.4.29 & 2023.6.8	
Conducted Software	UL	Antenna Port	Ver.2022.8.16& 2021.5.13	
Conducted Software	UL	Station Tool	Ver. 5.0 & 5.3 & 6.0 & 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.

8.1. LTE BAND 30

Test Engineer ID:	32546	Test Date:	2025-07-11
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OUTPUT POWER FOR LTE BAND 30 (5.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Conducted Average (dBm)											
				ANT 1			ANT 2			ANT 3			ANT 4		
				27685	27710	27735	27685	27710	27735	27685	27710	27735	27685	27710	27735
5.0	QPSK	1	0	25.69	25.67	25.70	23.25	23.35	23.37	24.90	24.90	24.98	22.65	22.65	22.70
		1	12	25.70	25.70	25.65	23.29	23.40	23.29	24.95	24.94	25.00	22.69	22.68	22.68
		1	24	25.69	25.67	25.61	23.33	23.34	23.27	24.90	24.92	24.93	22.64	22.64	22.61
		12	0	24.68	24.65	24.54	22.23	22.23	22.27	24.00	23.93	24.04	21.63	21.60	21.62
		12	6	24.70	24.69	24.63	22.29	22.27	22.31	24.01	23.96	24.04	21.66	21.60	21.67
		12	11	24.66	24.59	24.52	22.25	22.21	22.28	23.95	23.97	24.01	21.59	21.61	21.51
		25	0	24.66	24.60	24.60	22.22	22.20	22.26	23.92	23.91	23.89	21.54	21.57	21.56
	16QAM	1	0	24.72	24.70	24.70	22.28	22.20	22.48	23.99	23.95	24.01	21.70	21.68	21.72
		1	12	24.72	24.68	24.67	22.40	22.41	22.42	24.03	24.02	24.06	21.71	21.72	21.68
		1	24	24.69	24.68	24.63	22.51	22.42	22.42	24.02	23.93	23.98	21.71	21.70	21.71
		12	0	23.70	23.68	23.58	21.24	21.26	21.37	22.97	22.95	23.03	20.64	20.57	20.63
		12	6	23.66	23.70	23.58	21.28	21.30	21.40	23.01	22.98	23.03	20.68	20.59	20.66
		12	11	23.67	23.63	23.56	21.25	21.24	21.35	22.99	22.97	22.99	20.60	20.58	20.51
		25	0	23.66	23.61	23.54	21.27	21.22	21.28	22.95	22.85	22.98	20.64	20.53	20.63
	64QAM	1	0	23.75	23.58	23.71	21.48	21.60	21.36	22.98	23.02	22.90	20.62	20.65	20.61
		1	12	23.71	23.70	23.70	21.58	21.56	21.37	23.00	22.99	22.99	20.70	20.70	20.71
		1	24	23.61	23.54	23.71	21.52	21.52	21.40	22.92	23.04	22.89	20.66	20.66	20.59
		12	0	22.70	22.70	22.55	20.35	20.27	20.43	21.93	21.88	22.02	19.71	19.55	19.67
		12	6	22.75	22.64	22.54	20.40	20.27	20.45	22.05	21.97	22.07	19.67	19.64	19.67
		12	11	22.62	22.55	22.64	20.34	20.24	20.41	22.00	22.03	21.99	19.69	19.54	19.62
		25	0	22.64	22.62	22.52	20.24	20.23	20.38	21.96	21.92	21.99	19.64	19.55	19.64
	256QAM	1	0	20.76	20.77	20.68	18.31	18.27	18.43	20.09	20.03	20.10	17.70	17.69	17.82
		1	12	20.85	20.81	20.72	18.45	18.43	18.41	20.12	20.17	20.05	17.72	17.90	17.84
		1	24	20.73	20.67	20.67	18.31	18.25	18.28	20.02	20.05	20.04	17.71	17.58	17.62
		12	0	20.70	20.63	20.60	18.23	18.20	18.38	20.00	19.91	20.02	17.65	17.60	17.66
		12	6	20.73	20.67	20.65	18.29	18.22	18.43	20.04	19.98	20.04	17.69	17.63	17.67
		12	11	20.64	20.60	20.50	18.27	18.26	18.35	19.98	20.02	20.01	17.68	17.57	17.57
		25	0	20.67	20.60	20.51	18.23	18.20	18.35	19.94	19.90	19.99	17.62	17.55	17.66

OUTPUT POWER FOR LTE BAND 30 (10.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Conducted Average (dBm)											
				ANT 1			ANT 2			3			ANT 4		
				N/A	27710	N/A	N/A	27710	N/A	N/A	27710	N/A	N/A	27710	N/A
10.0	QPSK	1	0		25.66			23.40			24.95			22.65	
		1	24		25.70			23.40			25.00			22.70	
		1	49		25.59			23.34			24.98			22.61	
		25	0		24.67			22.34			24.01			21.62	
		25	12		24.69			22.34			24.02			21.69	
		25	24		24.66			22.31			24.00			21.56	
		50	0		24.65			22.31			23.98			21.61	
	16QAM	1	0		24.75			22.42			23.93			21.67	
		1	24		24.63			22.40			23.95			21.71	
		1	49		24.65			22.41			23.92			21.66	
		25	0		23.65			21.37			23.01			20.64	
		25	12		23.65			21.38			22.99			20.67	
		25	24		23.57			21.36			23.02			20.57	
		50	0		23.61			21.32			23.00			20.63	
	64QAM	1	0		23.71			21.40			22.93			20.71	
		1	24		23.72			21.38			23.00			20.73	
		1	49		23.72			21.33			23.03			20.54	
		25	0		22.62			20.36			21.96			19.64	
		25	12		22.59			20.32			21.99			19.62	
		25	24		22.55			20.31			21.99			19.54	
		50	0		22.58			20.33			21.97			19.60	
	256QAM	1	0		20.72			18.38			20.11			17.78	
		1	24		20.76			18.48			20.15			17.78	
		1	49		20.56			18.24			19.89			17.51	
		25	0		20.58			18.31			19.97			17.62	
		25	12		20.58			18.35			20.05			17.65	
		25	24		20.65			18.31			19.95			17.56	
		50	0		20.64			18.61			19.96			17.60	

8.2. 5G NR n30

Test Engineer ID:	25780	Test Date:	2025-07-09
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OUTPUT POWER FOR 5G NR n30 (5.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Conducted Average (dBm)											
				ANT 1			ANT 2			ANT 3			ANT 4		
				461500	462000	462500	461500	462000	462500	461500	462000	462500	461500	462000	462500
5.0	BPSK	1	0	20.12	20.12	20.12	18.37	18.10	18.14	19.44	19.40	19.41	17.21	17.21	16.94
		1	1	20.67	20.63	20.59	18.63	18.68	18.68	19.99	19.97	19.98	17.68	17.65	17.51
		1	23	20.58	20.56	20.50	18.62	18.61	18.62	19.91	19.87	19.87	17.61	17.65	17.65
		1	24	20.08	20.05	20.00	18.33	18.09	18.05	19.37	19.34	19.36	17.16	17.16	17.04
		12	6	20.65	20.70	20.62	18.63	18.65	18.69	19.97	20.00	20.00	17.70	17.69	17.62
		25	0	25.20	25.13	25.15	23.19	23.10	23.09	24.50	24.47	24.46	22.19	22.20	22.10
	QPSK	1	0	19.65	19.59	19.62	17.66	17.68	17.63	18.93	18.96	18.92	16.75	16.65	16.60
		1	1	20.66	20.65	20.64	18.70	18.64	18.65	19.99	19.96	19.98	17.68	17.69	17.62
		1	23	20.58	20.58	20.56	18.63	18.62	18.57	19.91	19.89	19.86	17.69	17.63	17.60
		1	24	19.57	19.55	19.47	17.85	17.60	17.60	18.84	18.84	18.85	16.70	16.61	16.54
		12	6	20.66	20.65	20.65	18.68	18.63	18.70	19.77	19.96	20.00	17.64	17.56	17.70
		25	0	24.61	24.61	24.56	23.02	22.67	22.64	23.94	23.91	23.90	21.73	21.65	21.59
	16QAM	1	0	18.70	18.74	18.46	16.65	16.65	16.63	17.85	17.85	17.83	15.68	15.58	15.61
		1	1	19.68	19.72	19.57	17.71	17.60	17.67	18.92	18.90	18.86	16.69	16.62	16.58
		1	23	19.69	19.59	19.49	17.66	17.53	17.58	18.82	18.81	18.80	16.61	16.51	16.49
		1	24	18.63	18.60	18.40	16.72	16.62	16.59	17.68	17.72	17.89	15.58	15.50	15.48
		12	6	19.67	19.66	19.45	17.67	17.59	17.62	18.85	18.82	18.90	16.64	16.61	16.51
		25	0	23.74	23.68	23.41	21.23	21.08	21.07	22.35	22.30	22.42	20.11	20.06	20.06
	64QAM	1	0	18.23	18.19	17.94	16.40	16.12	16.02	17.34	17.28	17.33	15.14	15.06	15.02
		1	1	18.21	18.26	18.02	16.50	16.05	16.09	17.47	17.36	17.33	15.11	15.17	15.10
		1	23	18.15	18.18	17.96	16.02	16.17	16.02	17.39	17.34	17.45	15.07	15.01	15.13
		1	24	18.12	18.15	17.87	15.96	15.91	16.01	17.27	17.27	17.39	14.95	14.98	15.05
		12	6	18.22	18.19	17.93	16.07	16.08	16.04	17.35	17.33	17.50	15.09	15.05	15.10
		25	0	23.20	23.16	22.93	21.04	21.04	21.03	22.31	22.32	22.47	20.11	20.03	20.09
	256QAM	1	0	16.24	16.19	15.80	14.06	14.11	14.08	15.34	15.30	15.48	13.12	13.06	13.10
		1	1	16.23	16.15	16.07	14.14	14.19	14.22	15.39	15.37	15.33	13.11	13.05	13.17
		1	23	16.15	16.10	15.89	14.05	14.11	14.01	15.30	15.22	15.38	13.09	13.04	13.12
		1	24	16.12	16.09	15.81	14.10	13.95	14.00	15.23	15.19	15.35	13.00	13.14	13.03
		12	6	16.18	16.13	15.89	14.06	14.13	14.09	15.30	15.33	15.46	13.12	13.03	13.14
		25	0	21.17	21.14	20.89	19.05	19.08	19.03	20.27	20.26	20.44	18.08	18.04	18.10

OUTPUT POWER FOR 5G NR n30 (10.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Conducted Average (dBm)											
				ANT 1			ANT 2			3			ANT 4		
				N/A	462000	N/A	N/A	462000	N/A	N/A	462000	N/A	N/A	462000	N/A
10.0	BPSK	1	0		19.90			18.08			19.38			17.06	
		1	1		20.70			18.66			19.98			17.70	
		1	50		20.61			18.69			20.00			17.67	
		1	51		20.03			18.11			19.35			17.05	
		25	12		20.59			18.65			19.92			17.61	
		50	0		25.20			23.12			24.43			22.19	
	QPSK	1	0		19.59			17.57			18.92			16.57	
		1	1		20.68			18.70			19.97			17.68	
		1	50		20.68			18.65			19.96			17.70	
		1	51		19.53			17.57			18.90			16.55	
		25	12		20.68			18.67			19.97			17.61	
		50	0		24.60			22.56			23.93			21.55	
	16QAM	1	0		18.50			16.66			17.83			15.62	
		1	1		19.61			17.55			18.86			16.58	
		1	50		19.38			17.63			19.00			16.56	
		1	51		18.52			16.61			17.97			15.59	
		25	12		19.62			17.64			19.00			16.59	
		50	0		23.58			21.64			23.01			20.59	
	64QAM	1	0		18.09			16.10			17.50			15.04	
		1	1		17.98			16.02			17.52			15.10	
		1	50		18.05			15.98			17.46			15.05	
		1	51		18.04			15.93			17.49			15.06	
		25	12		23.04			20.96			22.52			20.09	
		50	0		18.04			15.96			17.52			15.09	
	256QAM	1	0		15.98			14.04			15.50			13.03	
		1	1		16.24			14.03			15.41			13.11	
		1	50		15.88			14.10			15.40			12.98	
		1	51		15.94			13.96			15.27			12.96	
		25	12		15.90			14.06			15.44			13.06	
		50	0		21.01			19.04			20.43			18.07	

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.

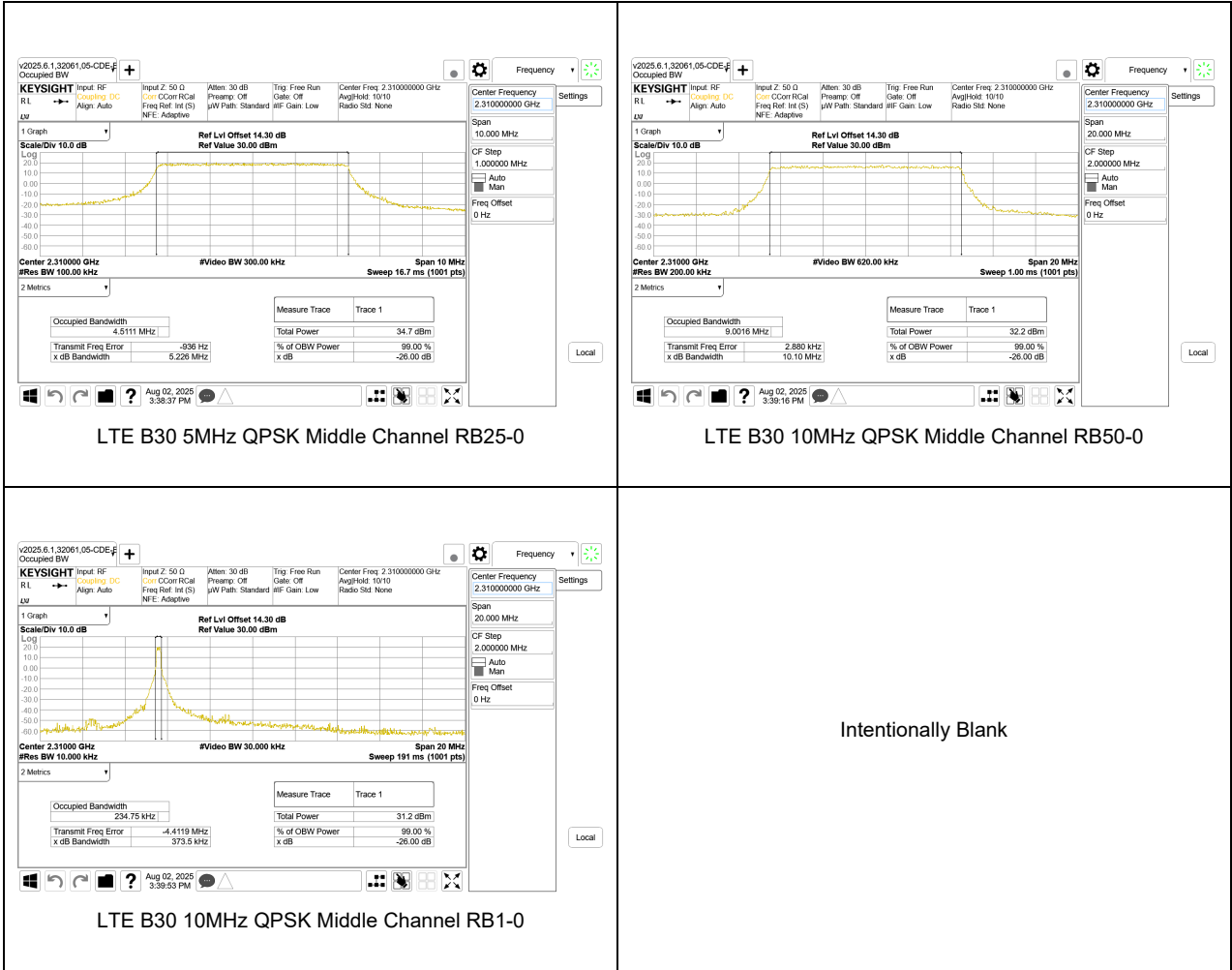
LTE BAND 30

Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 30	5MHz, QPSK	25/0	2310.0	4.511	5.226
	5MHz, 16QAM			4.518	5.121
	10MHz, QPSK	50/0		9.002	10.10
	10MHz, 16QAM			9.011	9.993
	10MHz, QPSK	1/0		0.234	0.3735

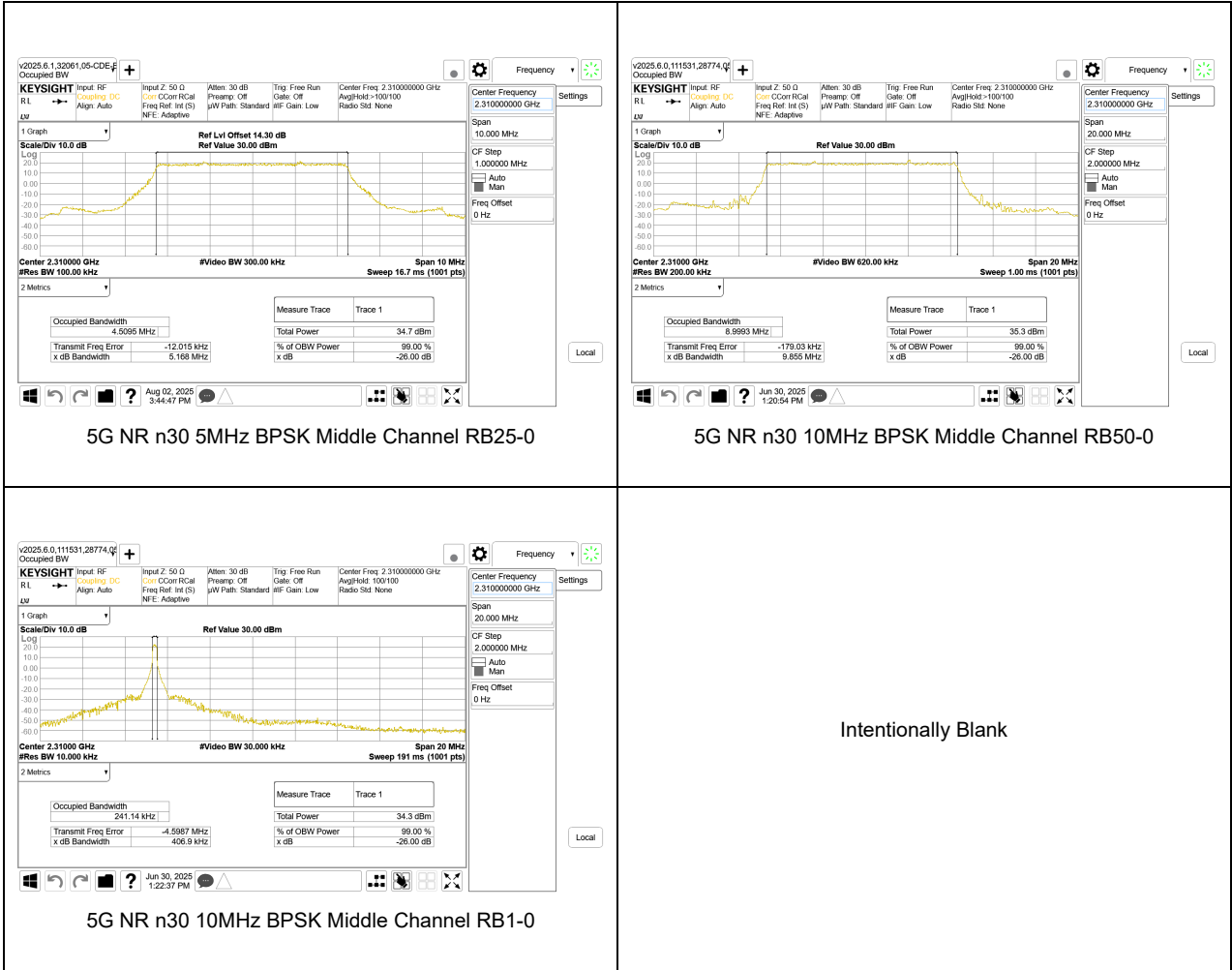
5G NR n30

Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
5G NR n30	5MHz, BPSK	25/0	2310.0	4.510	5.168
	5MHz, QPSK			4.509	5.197
	5MHz, 16QAM			4.512	5.281
	10MHz, BPSK	50/0		8.999	9.855
	10MHz, QPSK			8.979	9.897
	10MHz, 16QAM			8.992	9.966
	10MHz, BPSK	1/0		0.241	0.4069

9.1.1. LTE BAND 30



9.1.2. 5G NR n30



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.

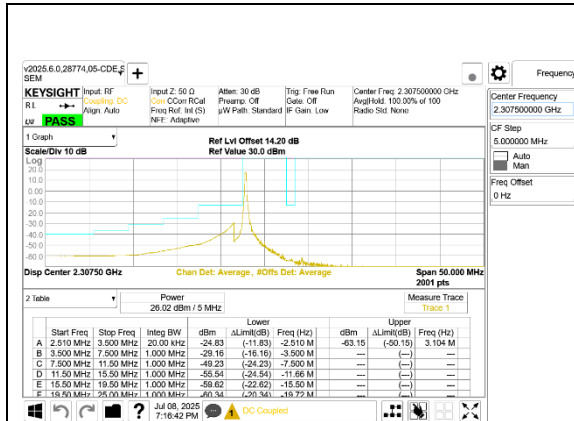
TEST PROCEDURE (BAND 30)

(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.

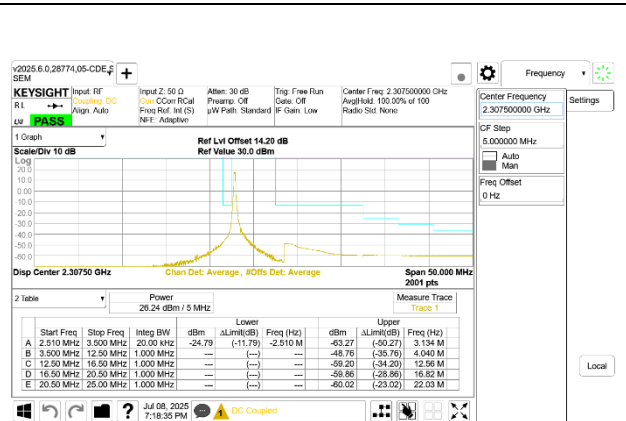
To show compliance with this requirement the spectrum analyzer is configured to measure the adjacent channel power for the frequency blocks adjacent to the channel edge. The integration of power is performed over a bandwidth > 1MHz and if the measurement is less than -13dBm when measured over more than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

RESULTS

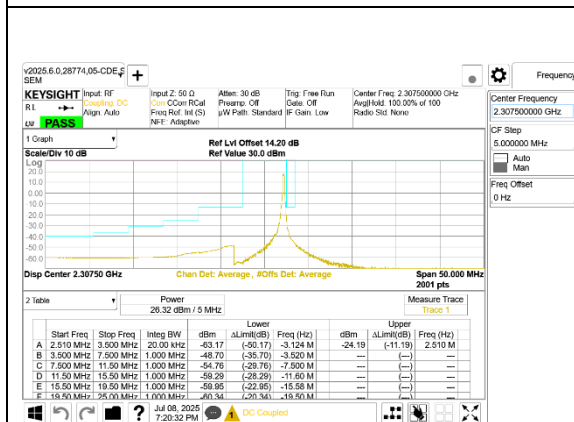
9.2.1. LTE BAND 30 EMISSION MASK



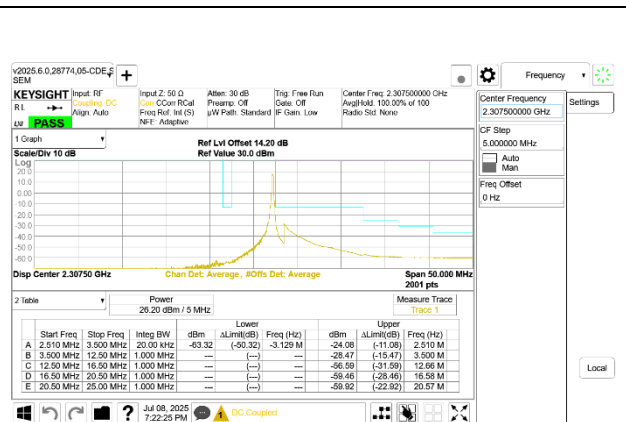
LTE B30 5MHz QPSK Low Channel RB1-0 (Low side)



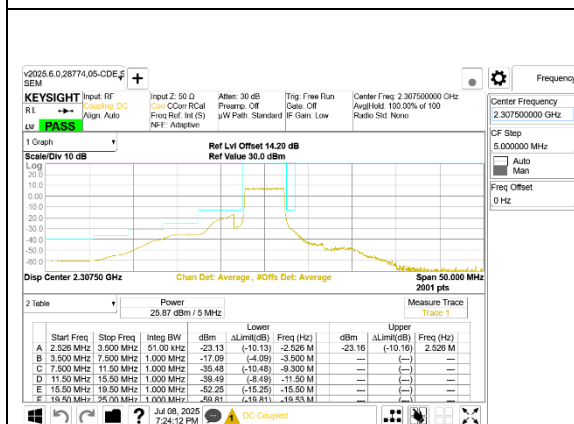
LTE B30 5MHz QPSK Low Channel RB1-0 (High side)



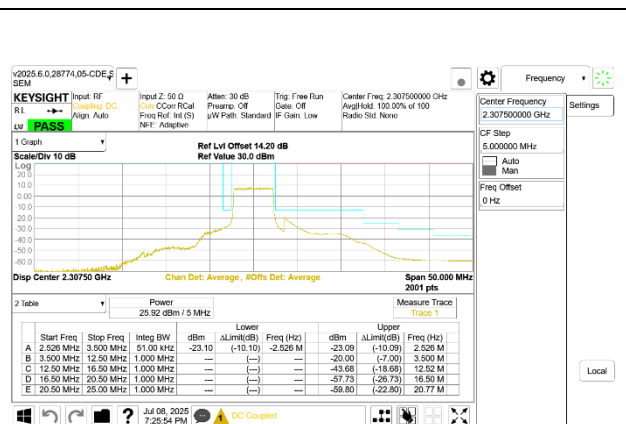
LTE B30 5MHz QPSK Low Channel RB1-24 (Low side)



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

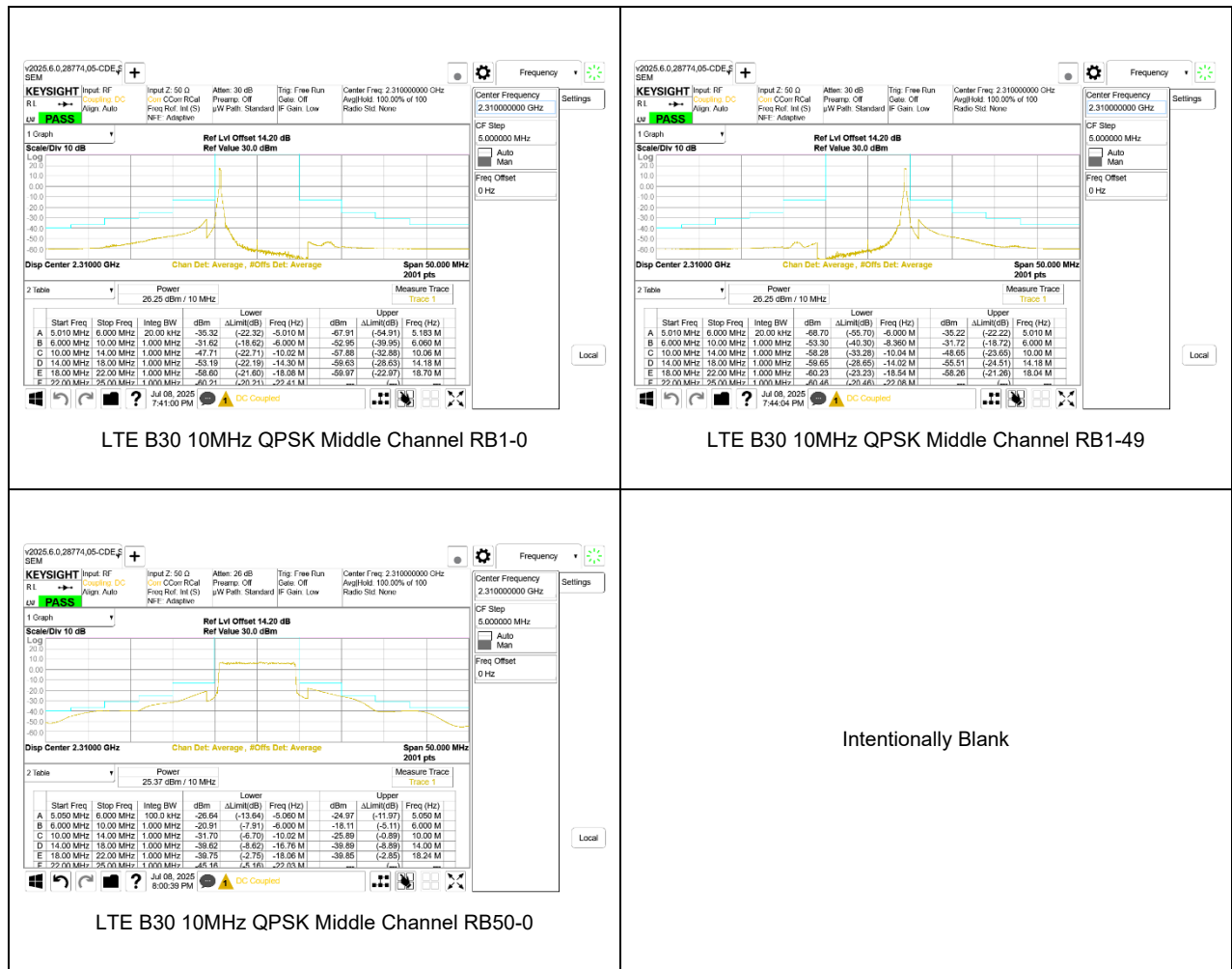


LTE B30 5MHz QPSK Low Channel RB25-0 (Low side)

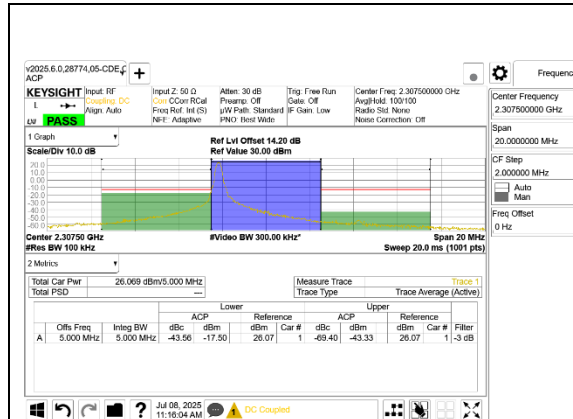


LTE B30 5MHz QPSK Low Channel RB25-0 (High side)

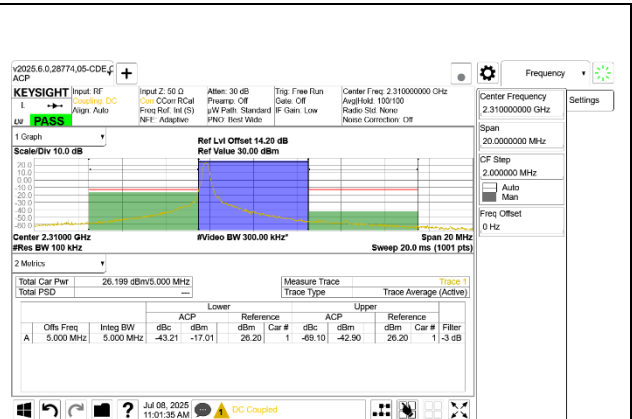




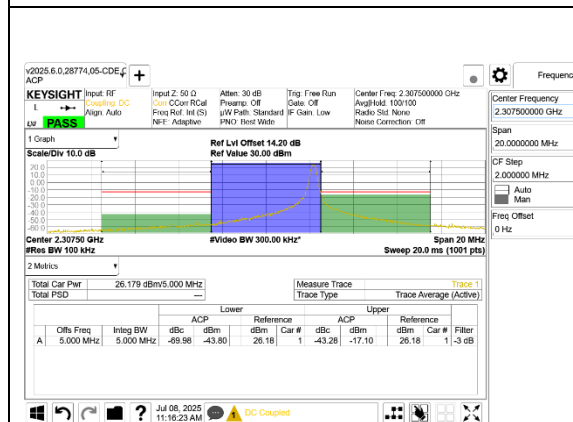
9.2.2. LTE BAND 30 ADJACENT CHANNEL POWER



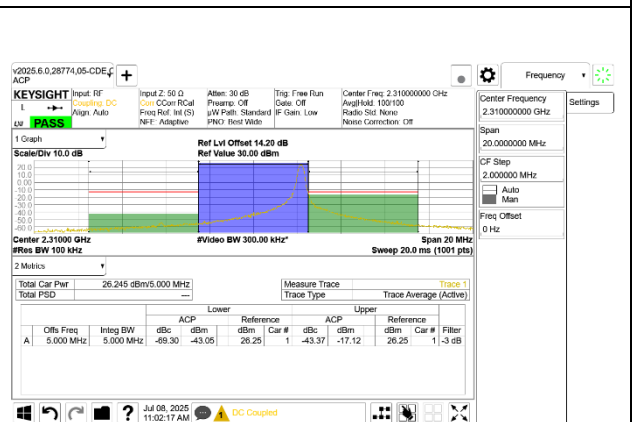
LTE B30 5MHz QPSK Low Channel RB1-0



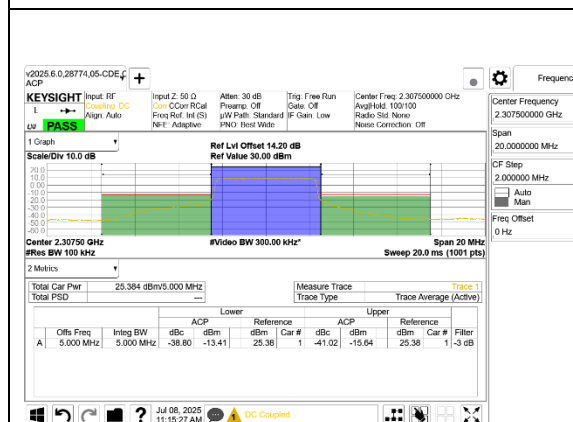
LTE B30 5MHz QPSK Mid Channel RB1-0



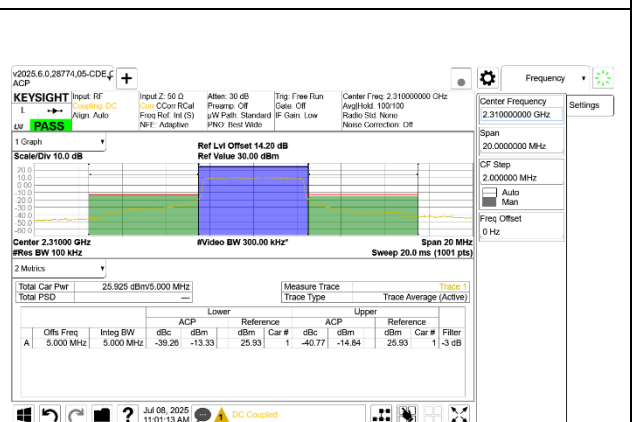
LTE B30 5MHz QPSK Low Channel RB1-24



LTE B30 5MHz QPSK Mid Channel RB1-24



LTE B30 5MHz QPSK Low Channel RB25-0



LTE B30 5MHz QPSK Mid Channel RB25-0



9.2.3. 5G NR n30 EMISSION MASK

