

TEST REPORT

Report Number: 15496249-E23V1

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 24E, PART 25
ISED RSS-GEN ISSUE 5 + A1 + A2, RSS-133 ISSUE 7

Date Of Issue:
2025-07-29

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Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
V1	2025-07-29	Initial Review	--

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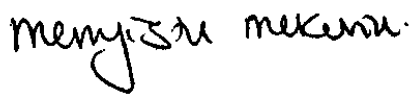


1. ATTESTATION OF TEST RESULTS

Applicant Name and Address	APPLE, INC 1 APPLE PARK WAY CUPERTINO, CA 95014, U.S.A.
Model	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 2025-07-25
Applicable Standards	FCC 47 CFR PART 2, PART 24E, PART 25 ISED RSS-GEN ISSUE 5 + A1 + A2, RSS-133 ISSUE 7
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.

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	24.232 (c)	RSS133§5.5	Complies	
Occupied Bandwidth	2.1049	RSS-GEN§6.7, RSS133	Complies	
Band Edge and Emission Mask	2.1051, 24.238 (a)	RSS133§5.6	Complies	
Out of Band Emissions	2.1051, 24.238 (a)	RSS133§5.6	Complies	
Frequency Stability	2.1055, 24.235	RSS133§5.4	Complies	
Peak-to-Average Ratio	24.232 (d)	RSS133§5.5	Complies	
Field Strength of Spurious Radiation	2.1053, 24.238 (a)	RSS133§5.6	Complies	

SUPPLEMENTAL COVERAGE FROM SPACE (SCS)

Under section § 25.109 (f) of the FCC rules Space and SCS earth stations providing SCS are subject to technical rules in parts 2, 22, 24, and 27 of this chapter based on the operating frequency band. Section § 25.204 (g) specifies that earth stations providing SCS pursuant to §§ 25.125 and 25.115 shall comply with the power requirements and out-of-band emission limits corresponding to devices operating in parts 22, 24, or 27 of this chapter (e.g., §§ 22.913, 24.232, 27.50), as required for their operating frequencies. We have clarified through KDB inquiry that the technical requirements from Part 90R should be applied for SCS operations in the 700 MHz Public Safety Band.

The table below identifies the SCS frequencies available for use and, for each band, the applicable FCC Part 22, 24, 27, and 90R technical requirements, the air interfaces supported by the device for SCS use.

The bands available for SCS and the bands supported by the devices in the scope of this report are:

Band	Frequency		Part 22/24/27/90 Rule parts	3GPP Band	Supported	Applicable to This Report
	DL (MHz)	UL (MHz)				
600 MHz:	614-652	663-698	27.5 (c) 27.50 (c) 27.53 (g)	71/n71	Yes	No
700 MHz:	729 – 746	699 –716	27.5 (c) 27.50 (c) 27.53 (g)	12/n12 17	Yes	No
	746 – 756	777 – 787	27.5 (b) 27.50 (b) 27.53 (f)	13/n13	Yes	No
	758-769	788-799	90R ^{Note 1}	14 / n14	Yes	No
	805-806 MHz				No	
800 MHz:	869-894	824-849	22H	WCDMA 5 5/n5 26/N26	Yes	No
Broadband PCS:	1930-1995	1850-1915	24E 24E	WCDMA 2 2/n2 25/n25	Yes	Yes

Note 1: Clarified through KDB inquiry that the technical requirements from Part 90R should be applied for SCS operations in the 700 MHz Public Safety Band.

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 24E, Part 25
- [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
- [FCC KDB 273109 D02](#): Part 25 SCS and CMRS-Bands
- ISED RSS-Gen Issue 5 + A1 + A2, RSS-133 Issue 7

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 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:

$$\text{Field Strength (dBuV/m)} = \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} - \text{Preamp Gain (dB)}$$

$$36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} = 28.9 \text{ dBuV/m}$$

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 peak EIRP output powers as follows:

LTE BAND 25

Part 24 / RSS 133									
EIRP Limit (W)		2.00							
Antenna Gain (dBi) (Ant 4)		0.70							
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
1.4	QPSK	1850.7	1914.3	25.20	25.90	0.389	1.098	1098	1M10G7W
	16QAM			24.41	25.11	0.324	1.097	1097	1M10D7W
3.0	QPSK	1851.5	1913.5	25.20	25.90	0.389	2.708	2708	2M71G7W
	16QAM			24.42	25.12	0.325	2.713	2713	2M71D7W
5.0	QPSK	1852.5	1912.5	25.20	25.90	0.389	4.470	4470	4M47G7W
	16QAM			24.37	25.07	0.321	4.495	4495	4M50D7W
10.0	QPSK	1855.0	1910.0	25.20	25.90	0.389	8.980	8980	8M98G7W
	16QAM			24.38	25.08	0.322	8.978	8978	8M98D7W
15.0	QPSK	1857.5	1907.5	25.20	25.90	0.389	13.394	13394	13M4G7W
	16QAM			24.45	25.15	0.327	13.543	13543	13M5D7W
20.0	QPSK	1860.0	1905.0	25.20	25.90	0.389	17.862	17862	17M9G7W
	16QAM			24.47	25.17	0.329	17.910	17910	17M9D7W

5G NR n25

Part 24/ RSS 133									
EIRP Limit (W)		2.00							
Antenna Gain (dBi) (Ant 4)		0.70							
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	1852.5	1912.5	25.20	25.90	0.389	4.507	4507	4M51G7W
	QPSK			25.20	25.90	0.389	4.502	4502	4M50G7W
	16QAM			24.38	25.08	0.322	4.514	4514	4M51D7W
10.0	BPSK	1855.0	1910.0	25.20	25.90	0.389	9.000	9000	9M00G7W
	QPSK			25.16	25.86	0.385	8.999	8999	9M00G7W
	16QAM			23.91	24.61	0.289	8.995	8995	9M00D7W
15.0	BPSK	1857.5	1907.5	25.18	25.88	0.387	13.451	13451	13M5G7W
	QPSK			25.20	25.90	0.389	13.462	13462	13M5G7W
	16QAM			23.94	24.64	0.291	13.470	13470	13M5D7W
20.0	BPSK	1860.0	1905.0	25.20	25.90	0.389	17.918	17918	17M9G7W
	QPSK			25.20	25.90	0.389	17.930	17930	17M9G7W
	16QAM			23.99	24.69	0.294	17.937	17937	17M9D7W
25.0	BPSK	1862.5	1902.5	25.20	25.90	0.389	22.927	22927	22M9G7W
	QPSK			25.20	25.90	0.389	22.951	22951	23M0G7W
	16QAM			23.98	24.68	0.294	22.954	22954	23M0D7W
30.0	BPSK	1865.0	1900.0	25.20	25.90	0.389	28.665	28665	28M7G7W
	QPSK			25.20	25.90	0.389	28.705	28705	28M7G7W
	16QAM			24.21	24.91	0.310	28.676	28676	28M7D7W
35.0	BPSK	1867.5	1897.5	25.19	25.89	0.388	32.274	32274	32M3G7W
	QPSK			25.20	25.90	0.389	32.271	32271	32M3G7W
	16QAM			24.65	25.35	0.343	32.190	32190	32M2D7W
40.0	BPSK	1870.0	1895.0	25.20	25.90	0.389	38.685	38685	38M7G7W
	QPSK			25.20	25.90	0.389	38.706	38706	38M7G7W
	16QAM			24.01	24.71	0.296	38.655	38655	38M7D7W

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/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 2 LTE Band 25	1850 - 1915	ANT3	-2.30	25.7	23.40
		ANT4	0.70	25.2	25.90
		ANT2	-1.40	25.7	24.30
		ANT1	-4.10	24.2	20.10
5G NR n2 5G NR n25	1850 - 1915	ANT3	-2.30	25.7	23.40
		ANT4	0.70	25.2	25.90
		ANT2	-1.40	25.7	24.30
		ANT1	-4.10	24.2	20.10

6.5. WORST-CASE CONFIGURATION AND MODE

This report covers the following technologies:

- LTE Band 25, 5G NR n25

LTE Band 2 and 5G NR n2 (1850-1910MHz) are covered by LTE Band 25 and 5G NR n25 respectively. Because they are the subset of LTE band 25 and 5G NR n25 with the same output power and supported bandwidths.

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 25 and 5G NR n25	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
1710 – 1915 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 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
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
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
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
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	10-31-2025
Directional Coupler	KRYTAR	101040010K	254458	10-30-2025
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.2023.3.3.0 & 2025.3.0	
Conducted Software	UL	Power Measurement	Ver 2023.08.14	
Conducted Software	UL	Antenna Port	Ver.2022.8.16	
Conducted Software	UL	Station Tool	Ver. 2025.3.0, v2025.4.1, v2025.4.8, v2025.6.0, v2025.6.1, v2025.7.0	
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.

OUTPUT POWER FOR LTE BAND 25 (5.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Conducted Average (dBm)											
				ANT 3			ANT 4			ANT 2			ANT 1		
				26065	26365	26665	26065	26365	26665	26065	26365	26665	26065	26365	26665
5.0	QPSK	1	0	25.70	25.70	25.70	25.20	25.20	25.15	25.70	25.70	25.70	24.19	24.20	24.20
		1	12	25.55	25.62	25.61	25.02	25.12	25.13	25.55	25.64	25.59	24.11	24.03	24.03
		1	24	25.58	25.60	25.61	25.13	25.14	25.20	25.55	25.61	25.61	24.20	24.03	23.90
		12	0	25.43	25.44	25.45	24.14	24.03	24.11	25.45	25.46	25.47	23.14	23.01	23.15
		12	6	25.41	25.42	25.45	24.10	24.10	24.13	25.42	25.44	25.48	23.12	23.05	23.07
		12	11	25.39	25.41	25.41	24.08	24.02	24.10	25.42	25.44	25.42	23.14	23.03	22.98
	16QAM	25	0	25.41	25.41	25.44	24.07	24.01	24.12	25.39	25.43	25.45	23.11	22.94	23.03
		1	0	25.31	25.36	25.35	24.31	24.33	24.37	25.33	25.39	25.33	23.29	23.28	23.36
		1	12	25.27	25.27	25.25	24.29	24.26	24.29	25.24	25.23	25.31	23.26	23.16	23.23
		1	24	25.30	25.32	25.29	24.34	24.22	24.36	25.20	25.28	25.24	23.32	23.21	23.01
		12	0	24.13	24.17	24.19	23.16	23.08	23.16	24.20	24.21	24.21	22.15	22.08	22.19
		12	6	24.12	24.16	24.11	23.15	23.11	23.14	24.14	24.21	24.18	22.20	22.10	22.10
	64QAM	12	11	24.07	24.05	24.09	23.16	23.05	23.11	24.11	24.21	24.17	22.19	22.01	21.99
		25	0	24.10	24.10	24.10	23.16	23.01	23.16	24.10	24.17	24.14	22.19	21.96	22.04
		1	0	24.20	24.25	24.20	23.27	23.20	23.23	24.28	24.32	24.23	22.26	22.27	22.29
		1	12	24.17	24.21	24.21	23.18	23.24	23.24	24.25	24.23	24.21	22.27	22.15	22.17
		1	24	24.07	24.20	24.19	23.22	23.18	23.18	24.17	24.18	24.21	22.29	22.19	21.96
		12	0	23.12	23.20	23.24	22.21	22.11	22.21	23.19	23.20	23.22	21.19	21.06	21.19
	256QAM	12	6	23.15	23.13	23.15	22.14	22.17	22.18	23.16	23.18	23.25	21.21	21.11	21.12
		12	11	23.14	23.12	23.13	22.15	22.11	22.17	23.15	23.15	23.19	21.19	21.08	21.02
		25	0	23.15	23.17	23.13	22.11	22.08	22.16	23.13	23.14	23.19	21.17	21.01	21.08
		1	0	21.23	21.21	21.27	20.14	20.23	20.23	21.21	21.27	21.24	19.22	19.10	19.33
		1	12	21.23	21.17	21.13	20.24	20.26	20.25	21.25	21.15	21.26	19.30	19.17	19.14
		1	24	21.17	21.19	21.20	20.17	20.25	20.21	21.14	21.14	21.26	19.27	19.10	19.03

OUTPUT POWER FOR LTE BAND 25 (10.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Conducted Average (dBm)											
				ANT 3			ANT 4			ANT 2			ANT 1		
				26090	26365	26640	26090	26365	26640	26090	26365	26640	26090	26365	26640
10.0	QPSK	1	0	25.60	25.66	25.70	25.19	25.17	25.18	25.70	25.63	25.67	24.03	24.20	24.20
		1	24	25.69	25.70	25.66	25.20	25.20	25.19	25.66	25.70	25.70	24.20	24.07	24.11
		1	49	25.55	25.54	25.65	25.18	25.09	25.20	25.56	25.63	25.60	24.20	23.97	23.78
		25	0	25.54	25.42	25.46	24.25	24.14	24.14	25.52	25.41	25.40	23.14	23.09	23.15
		25	12	25.54	25.49	25.45	24.24	24.16	24.12	25.55	25.54	25.42	23.21	23.03	23.15
		25	24	25.52	25.49	25.48	24.25	24.20	24.21	25.45	25.52	25.50	23.25	22.99	22.98
	16QAM	50	0	25.50	25.40	25.42	24.25	24.12	24.10	25.51	25.43	25.39	23.19	23.00	23.06
		1	0	25.32	25.31	25.28	24.32	24.34	24.29	25.32	25.32	25.35	23.20	23.40	23.36
		1	24	25.40	25.27	25.33	24.38	24.37	24.35	25.33	25.35	25.34	23.32	23.27	23.28
		1	49	25.27	25.26	25.27	24.36	24.26	24.38	25.17	25.30	25.24	23.34	23.10	22.93
		25	0	24.22	24.11	24.14	23.33	23.17	23.15	24.19	24.11	24.15	22.17	22.12	22.25
		25	12	24.22	24.22	24.13	23.37	23.17	23.18	24.23	24.24	24.14	22.24	22.07	22.20
	64QAM	25	24	24.20	24.20	24.25	23.33	23.21	23.24	24.21	24.20	24.18	22.29	22.02	22.03
		50	0	24.22	24.11	24.14	23.33	23.17	23.15	24.18	24.09	24.10	22.21	22.05	22.09
		1	0	24.36	24.36	24.44	23.49	23.37	23.35	24.38	24.36	24.33	22.23	22.47	22.43
		1	24	24.46	24.36	24.42	23.60	23.38	23.45	24.42	24.43	24.36	22.41	22.30	22.36
		1	49	24.37	24.35	24.35	23.49	23.24	23.34	24.27	24.34	24.29	22.49	22.25	21.94
		25	0	23.24	23.12	23.13	22.36	22.16	22.17	23.24	23.15	23.13	21.17	21.12	21.22
	256QAM	25	12	23.26	23.25	23.16	22.37	22.18	22.20	23.24	23.24	23.12	21.22	21.08	21.18
		25	24	23.23	23.19	23.19	22.33	22.21	22.24	23.24	23.22	23.20	21.28	21.03	21.05
		50	0	23.23	23.10	23.16	22.35	22.13	22.12	23.22	23.11	23.12	21.21	21.08	21.10
		1	0	21.20	21.22	21.27	20.42	20.19	20.23	21.23	21.22	21.23	19.12	19.29	19.35
		1	24	21.34	21.35	21.36	20.53	20.35	20.36	21.36	21.35	21.42	19.30	19.28	19.30
		1	49	21.23	21.18	21.22	20.41	20.28	20.30	21.22	21.24	21.19	19.36	19.06	18.83

9. CONDUCTED TEST RESULTS

9.1. OCCUPIED BANDWIDTH

RULE PART(S)

FCC: §2.1049
ISED: RSS133

LIMITS

For reporting purposes only.

TEST PROCEDURE

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

RESULTS

There is no limit required and power is the same for low, middle and high channel; therefore, only middle channel was tested.

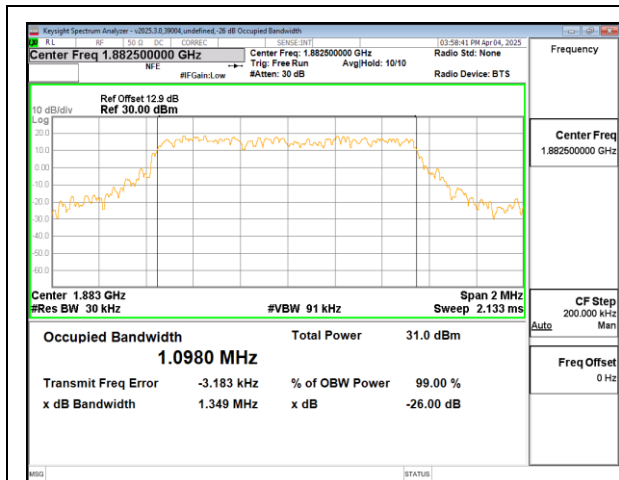
LTE BAND 25

Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 25	1.4MHz, QPSK	6/0	1882.5	1.098	1.35
	1.4MHz, 16QAM			1.097	1.43
	3MHz, QPSK	15/0		2.708	3.09
	3MHz, 16QAM			2.713	3.08
	5MHz, QPSK	25/0		4.470	5.03
	5MHz, 16QAM			4.495	5.09
	10MHz, QPSK	50/0		8.980	9.68
	10MHz, 16QAM			8.978	9.56
	15MHz, QPSK	75/0		13.394	14.16
	15MHz, 16QAM			13.543	14.30
	20MHz, QPSK	100/0		17.862	19.75
	20MHz, 16QAM			17.910	19.00
	20MHz, QPSK	1/0		0.277	0.46

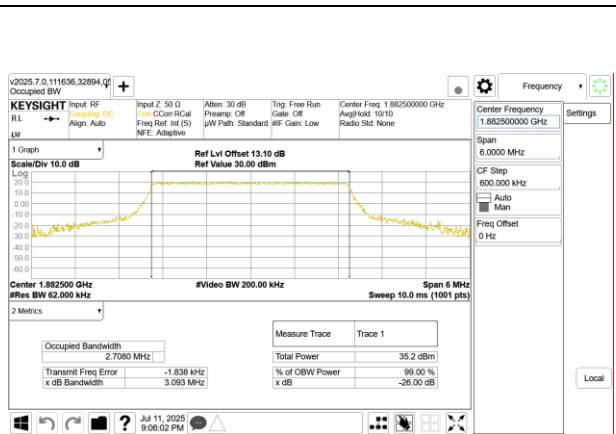
5G NR n25

Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
5G NR n25	5MHz, BPSK	25/0	1882.5	4.507	5.23
	5MHz, QPSK			4.502	5.30
	5MHz, 16QAM			4.514	5.17
	10MHz, BPSK	50/0		9.000	9.83
	10MHz, QPSK			8.999	9.92
	10MHz, 16QAM			8.995	9.86
	15MHz, BPSK	75/0		13.451	14.44
	15MHz, QPSK			13.462	14.58
	15MHz, 16QAM			13.470	14.52
	20MHz, BPSK	100/0		17.918	19.12
	20MHz, QPSK			17.930	19.23
	20MHz, 16QAM			17.937	19.16
	25MHz, BPSK	128/0		22.927	24.29
	25MHz, QPSK			22.951	24.34
	25MHz, 16QAM			22.954	24.380
	30MHz, BPSK	160/0		28.665	30.34
	30MHz, QPSK			28.705	30.30
	30MHz, 16QAM			28.676	30.35
	35MHz, BPSK	180/0		32.274	33.97
	35MHz, QPSK			32.271	34.09
	35MHz, 16QAM			32.190	34.03
	40MHz, BPSK	216/0		38.685	40.67
	40MHz, QPSK			38.706	40.77
	40MHz, 16QAM			38.655	40.68
40MHz, BPSK	1/0	0.290	0.47		

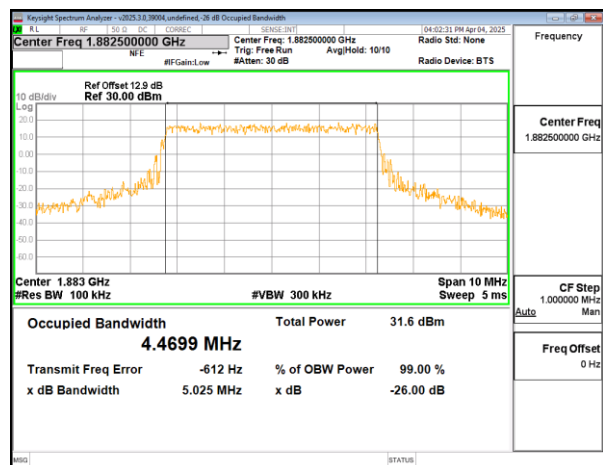
9.1.1. LTE BAND 25



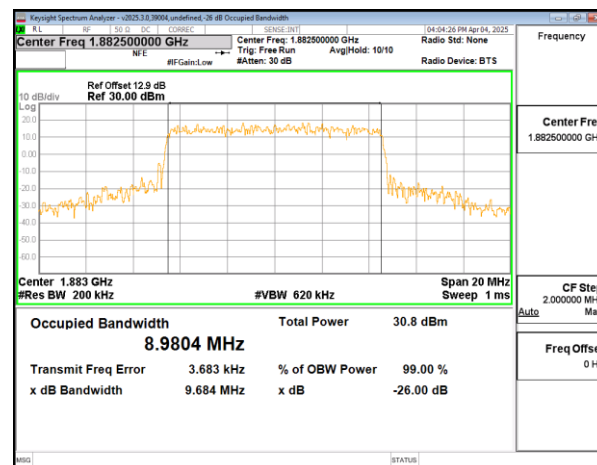
LTE B25 1.4MHz QPSK Middle Channel RB6-0



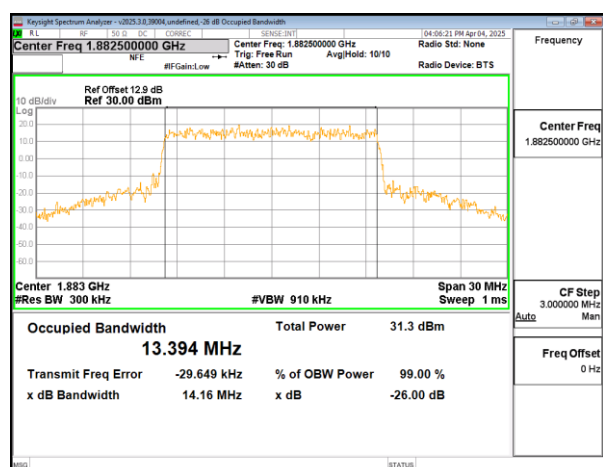
LTE B25 3MHz QPSK Middle Channel RB15-0



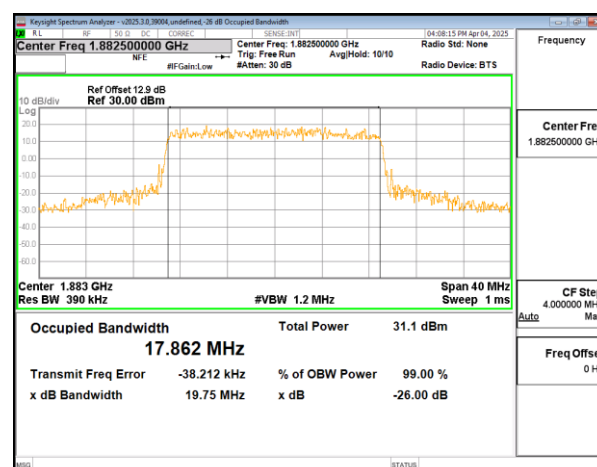
LTE B25 5MHz QPSK Middle Channel RB25-0



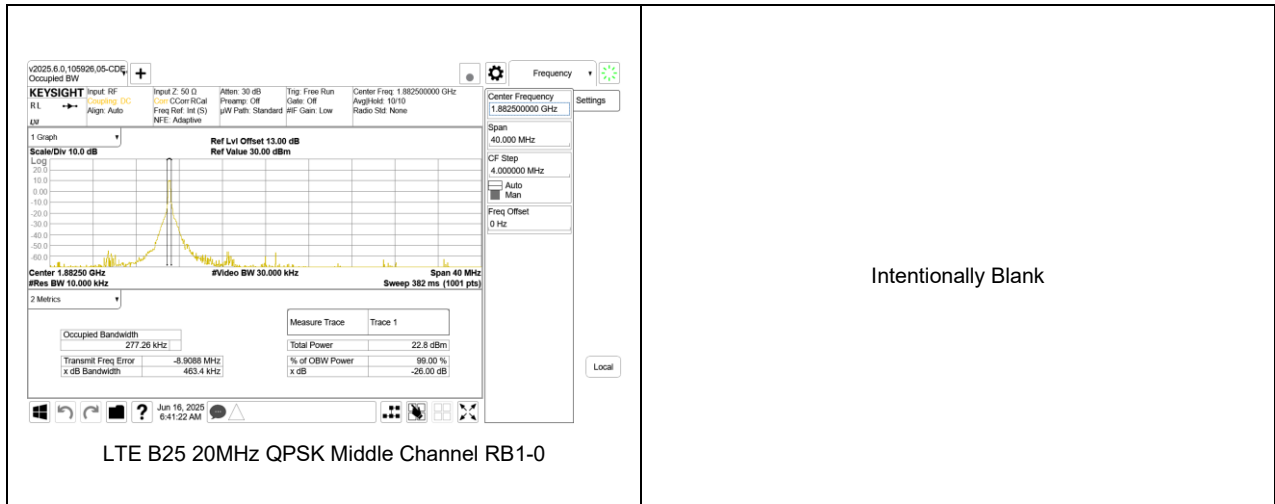
LTE B25 10MHz QPSK Middle Channel RB50-0



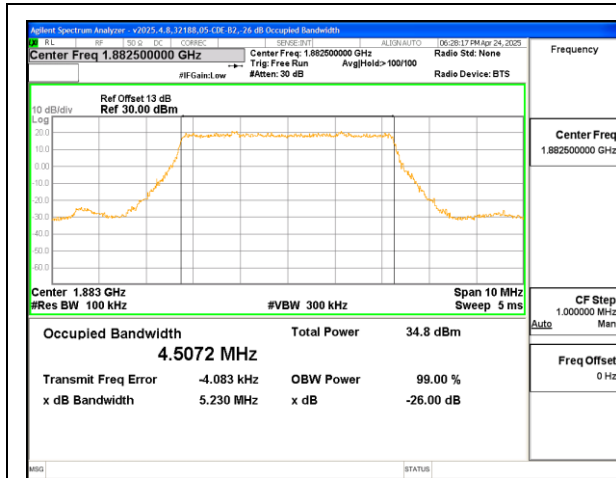
LTE B25 15MHz QPSK Middle Channel RB75-0



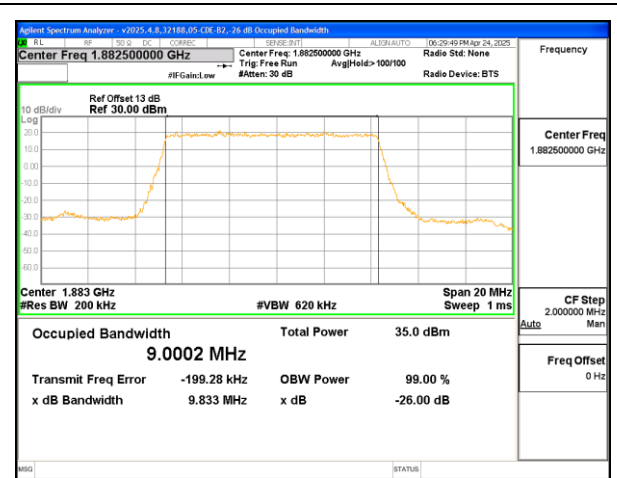
LTE B25 20MHz QPSK Middle Channel RB100-0



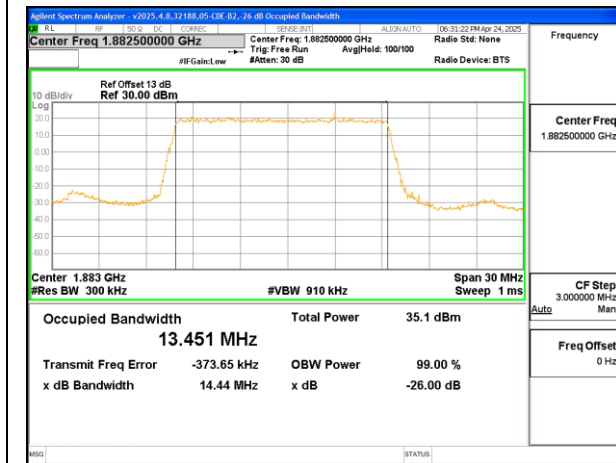
9.1.2. 5G NR n25



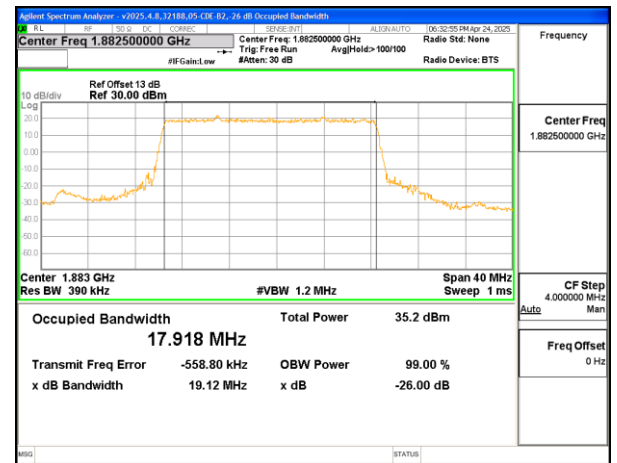
5G NR n25 5MHz BPSK Middle Channel RB25-0



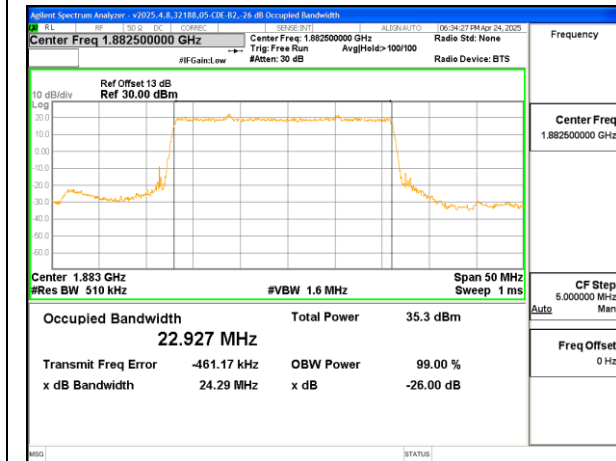
5G NR n25 10MHz BPSK Middle Channel RB50-0



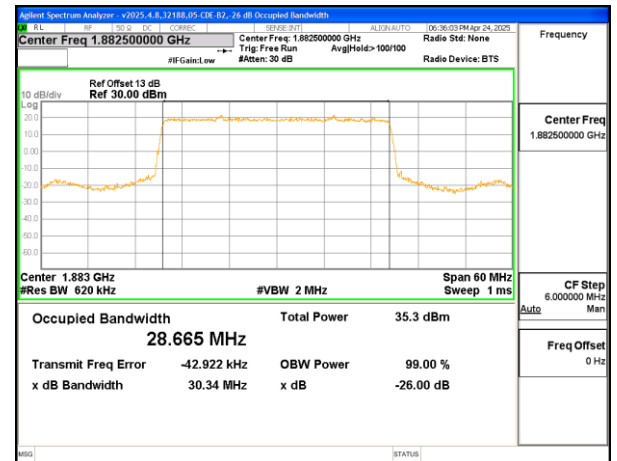
5G NR n25 15MHz BPSK Middle Channel RB75-0



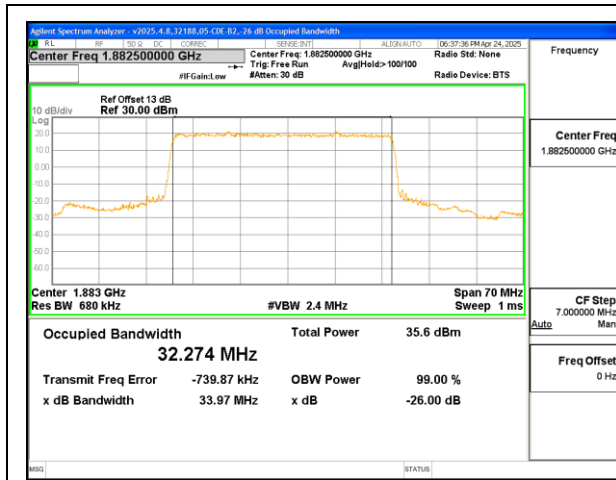
5G NR n25 20MHz BPSK Middle Channel RB100-0



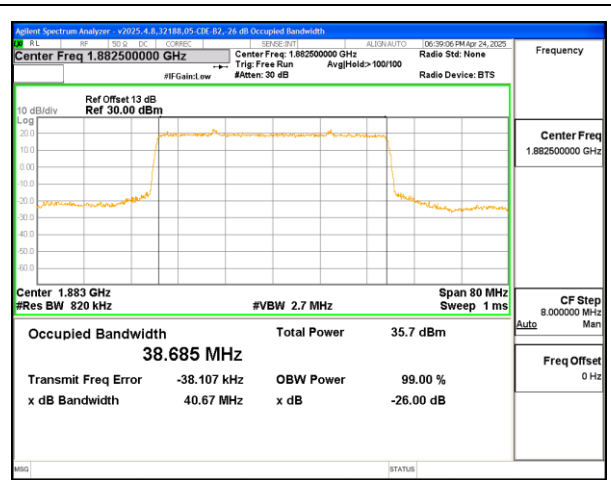
5G NR n25 25MHz BPSK Middle Channel RB128-0



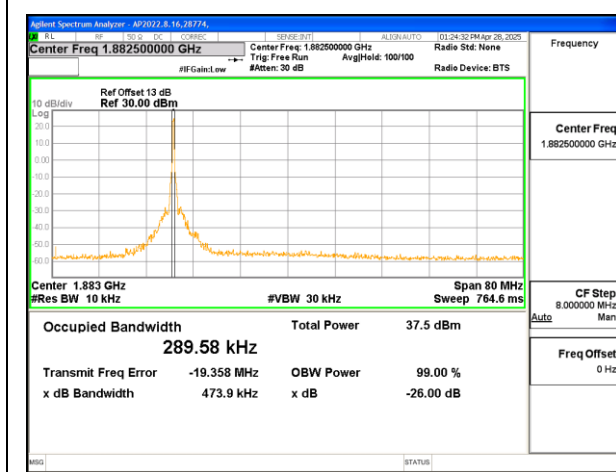
5G NR n25 30MHz BPSK Middle Channel RB160-0



5G NR n25 35MHz BPSK Middle Channel RB180-0



5G NR n25 40MHz BPSK Middle Channel RB216-0



5G NR n25 40MHz BPSK Middle Channel RB1-0

Intentionally Blank

9.2. EMISSION MASK AND ADJACENT CHANNEL POWER

LIMITS

FCC: §24.238 (a)

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

ISED: RSS133§5.6

For all equipment, the TRP or total conducted power (sum of conducted power across all antenna connectors), where applicable, of the unwanted emissions outside the frequency block or frequency block group shall not exceed the limits shown in the table 3.

Table 3: Unwanted emission limits for all equipment	
Offset frequency from the edge of the frequency block group (MHz)	Unwanted emission limit
≤ 1	-13 dBm/(1% of OBW)
> 1	-13 dBm/MHz

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.

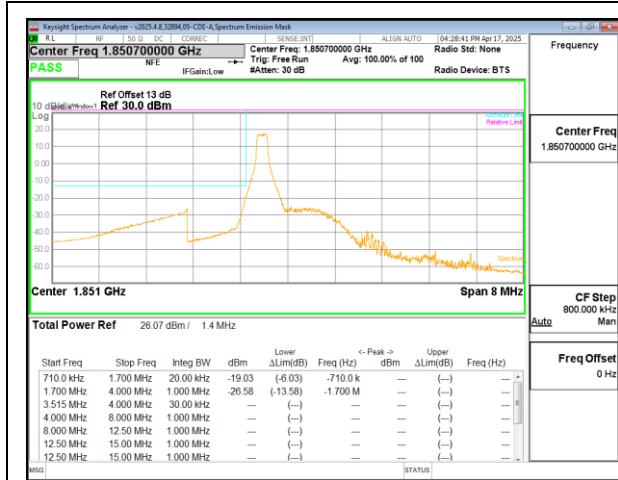
The transmitter output was connected to a base station simulator and configured to operate at maximum power. The band edge emissions were measured at the required operating frequencies in each band on the Spectrum Analyzer.

For each band edge measurement:

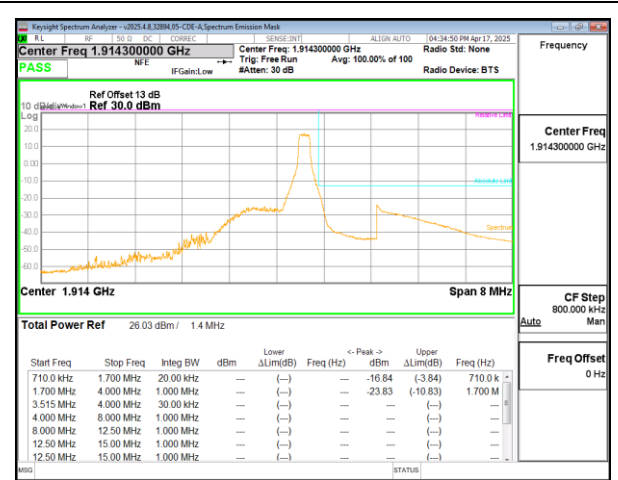
1. Set the spectrum analyzer span to include the block edge frequency.
2. Set a marker to point the corresponding band edge frequency in each test case.
3. Set display line at -13 dBm
4. Set resolution bandwidth to at least 1% of emission bandwidth.

RESULTS

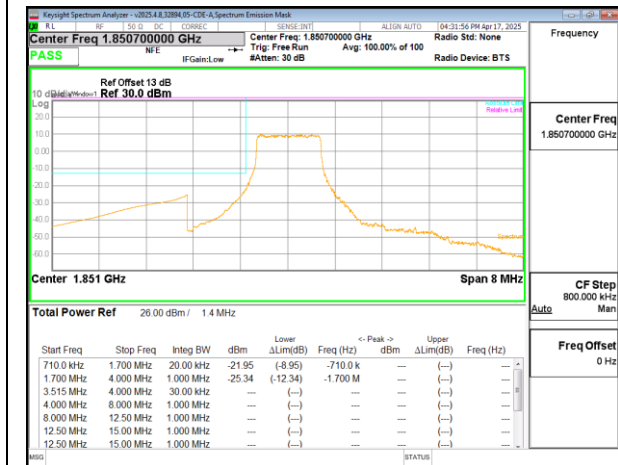
9.2.1. LTE BAND 25



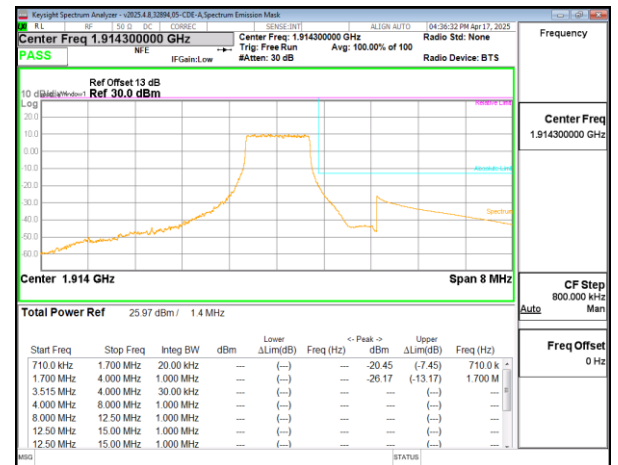
LTE B25 1.4MHz QPSK Low Channel RB1-0



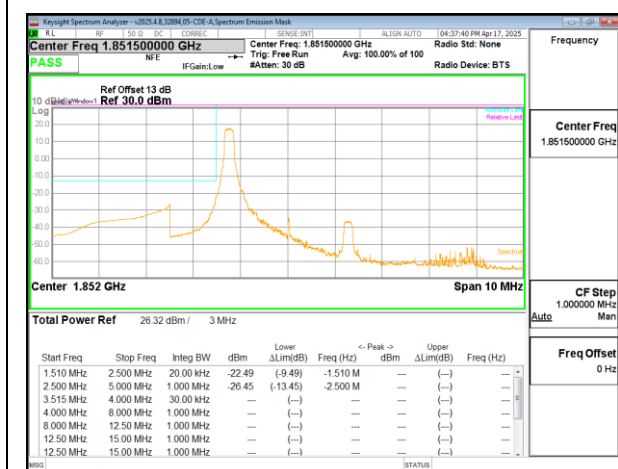
LTE B25 1.4MHz QPSK High Channel RB1-5



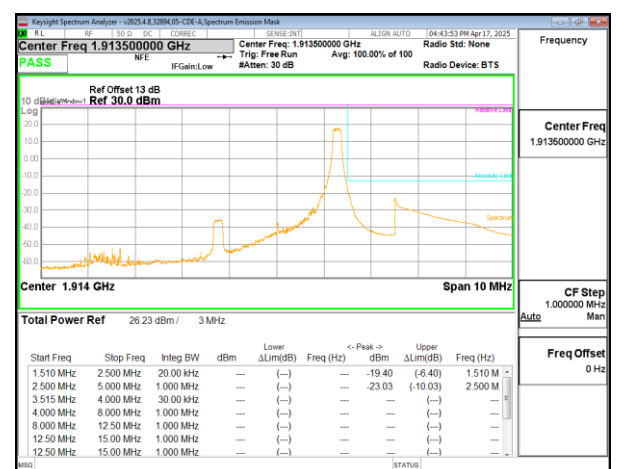
LTE B25 1.4MHz QPSK Low Channel RB6-0



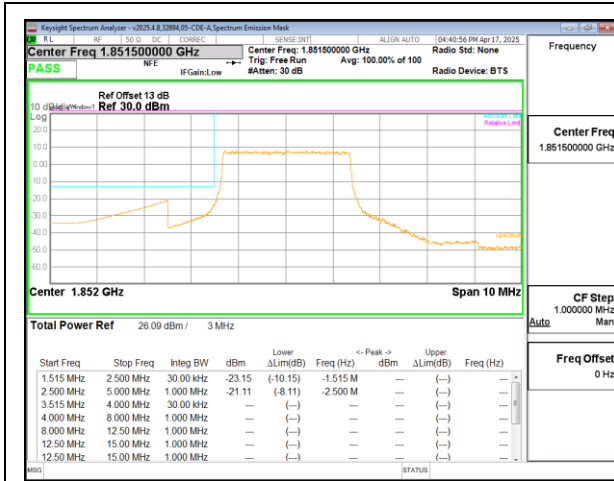
LTE B25 1.4MHz QPSK High Channel RB6-0



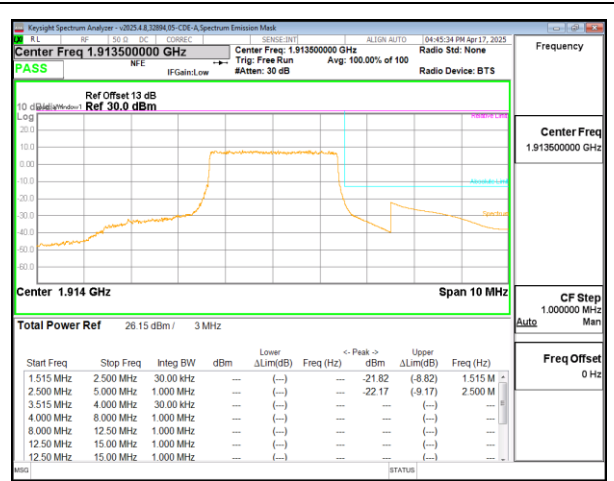
LTE B25 3MHz QPSK Low Channel RB1-0



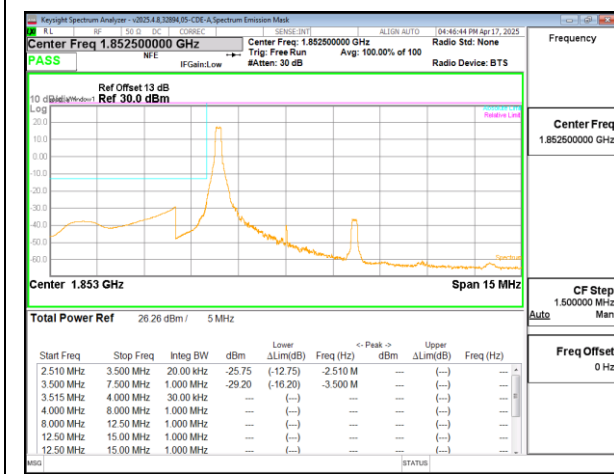
LTE B25 3MHz QPSK High Channel RB1-14



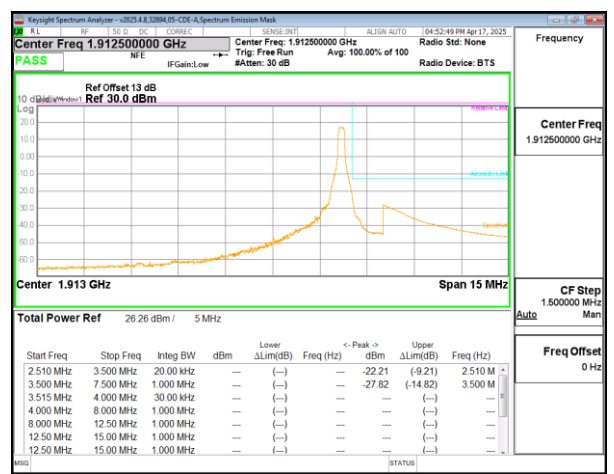
LTE B25 3MHz QPSK Low Channel RB15-0



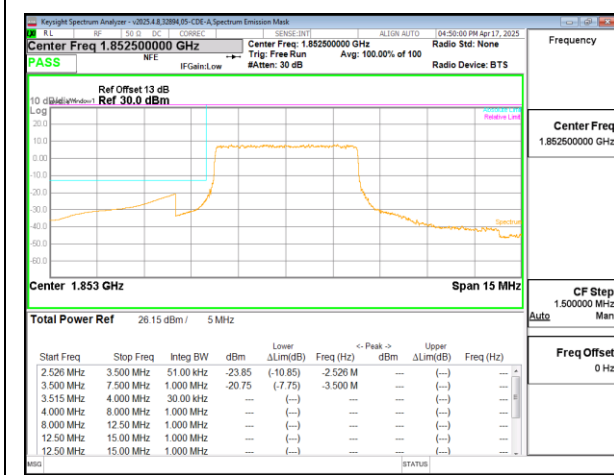
LTE B25 3MHz QPSK High Channel RB15-0



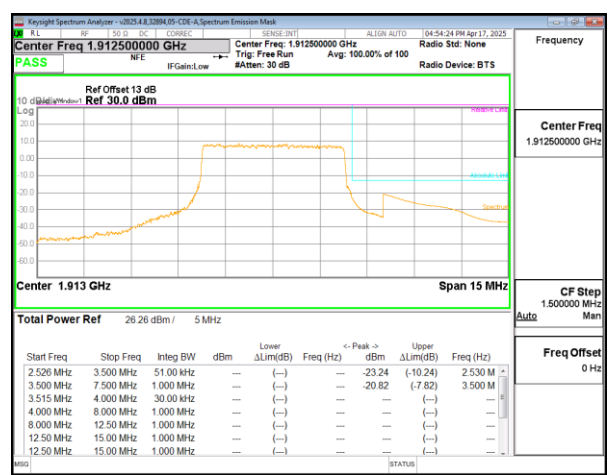
LTE B25 5MHz QPSK Low Channel RB1-0



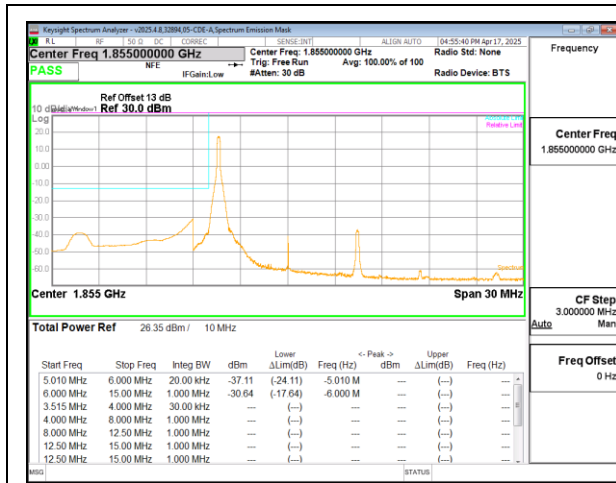
LTE B25 5MHz QPSK High Channel RB1-24



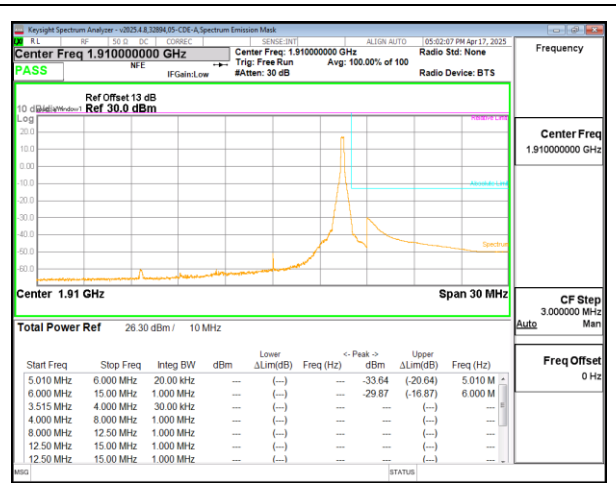
LTE B25 5MHz QPSK Low Channel RB25-0



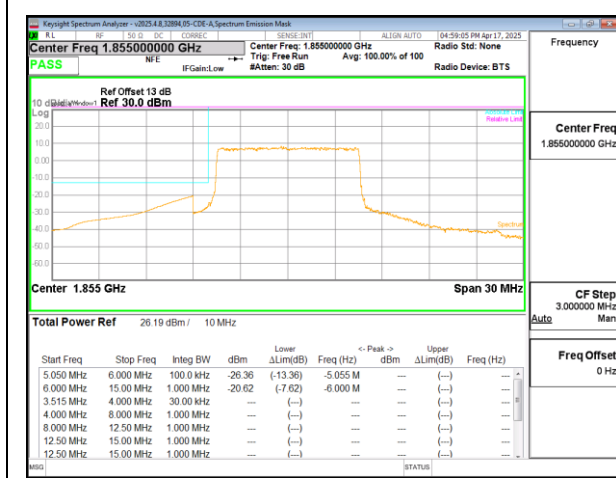
LTE B25 5MHz QPSK High Channel RB25-0



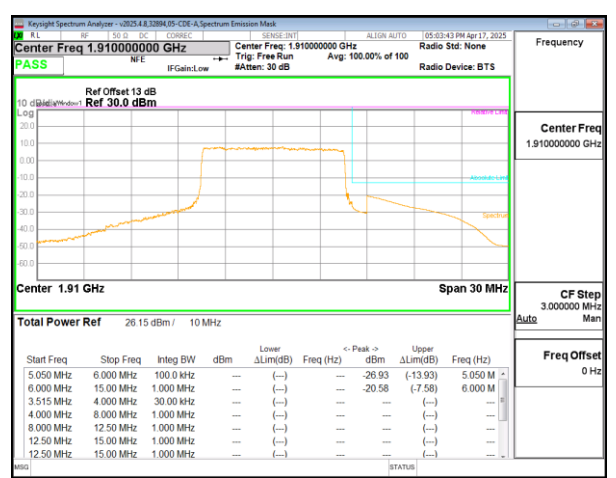
LTE B25 10MHz QPSK Low Channel RB1-0



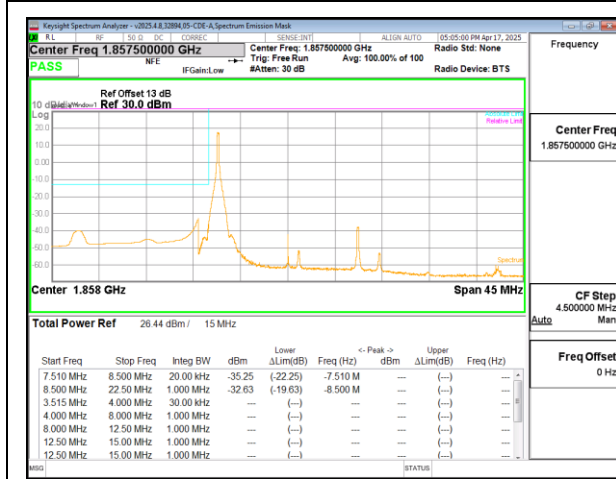
LTE B25 10MHz QPSK High Channel RB1-49



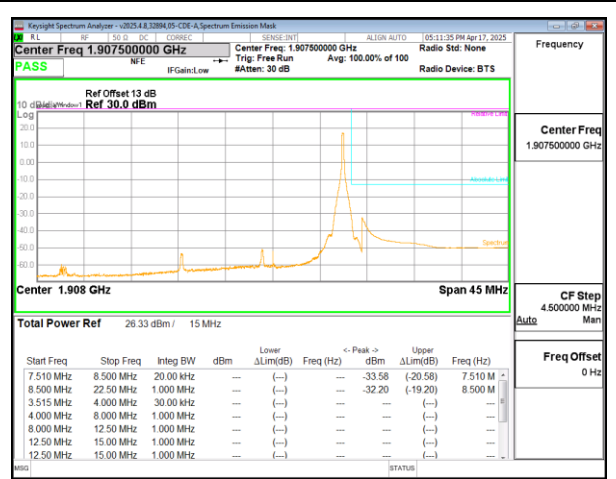
LTE B25 10MHz QPSK Low Channel RB50-0



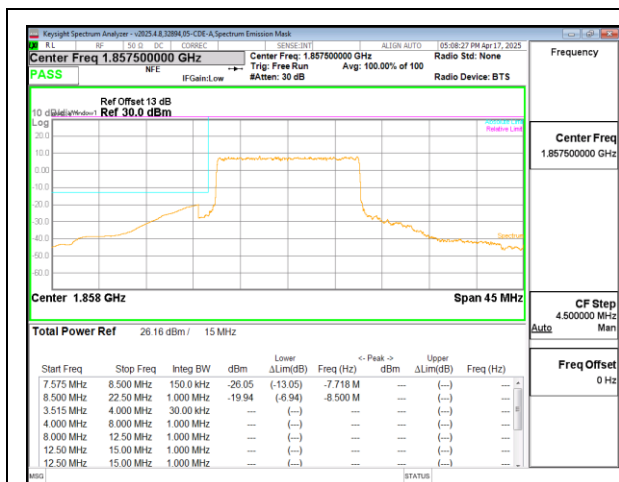
LTE B25 10MHz QPSK High Channel RB50-0



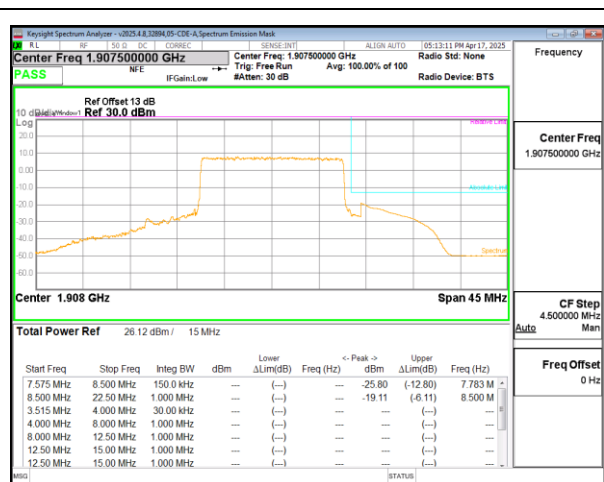
LTE B25 15MHz QPSK Low Channel RB1-0



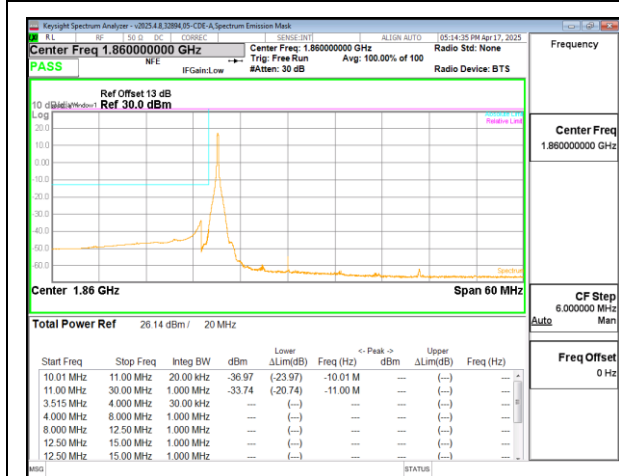
LTE B25 15MHz QPSK High Channel RB1-74



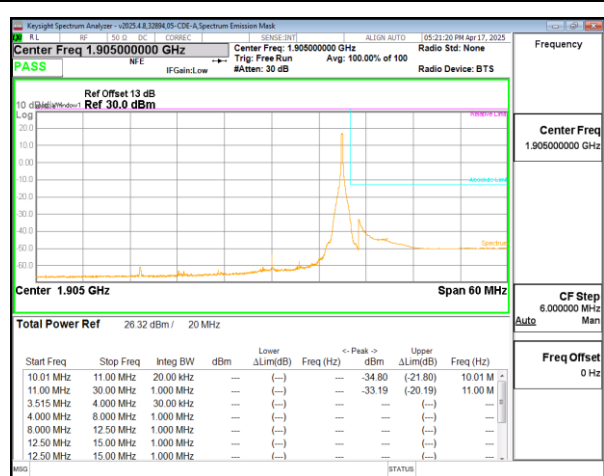
LTE B25 15MHz QPSK Low Channel RB75-0



LTE B25 15MHz QPSK High Channel RB75-0



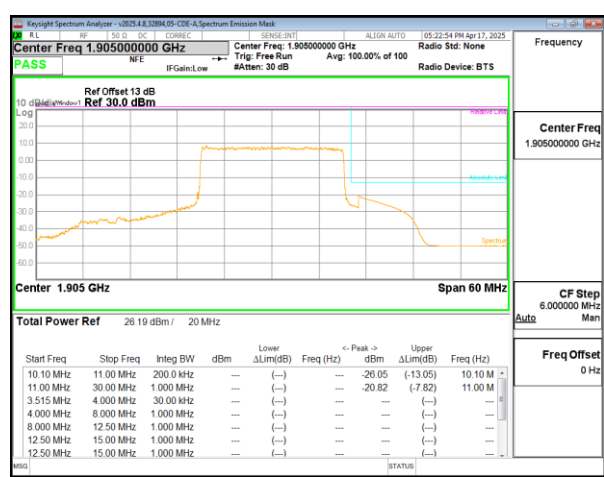
LTE B25 20MHz QPSK Low Channel RB1-0



LTE B25 20MHz QPSK High Channel RB1-99



LTE B25 20MHz QPSK Low Channel RB100-0



LTE B25 20MHz QPSK High Channel RB100-0