PCTEST
7185 Oakland Mills Road, Columbia, MD 21046 USA
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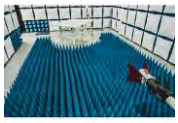
http://www.pctest.com



PART 27 MEASUREMENT REPORT

Applicant Name:
SONY Corporation
1-7-1 Konan
Minato-ku
Tokyo, 108-0075, Japan

Date of Testing:
8/2 – 10/04/2021
Test Site/Location:
PCTEST Lab. Columbia, MD, USA
Test Report Serial No.:
1M2108040087-17-R2.PY7

FCC ID:	**PY7-95324M**
Applicant Name:	**SONY Corporation**

Application Type:	Certification
EUT Type:	Portable Handset
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part:	27
Test Procedure(s):	ANSI C63.26-2015, ANSI/TIA-603-E-2016, KDB 971168 D01 v03r01

Note: This revised Test Report (S/N: 1M2108040087-17-R2.PY7) supersedes and replaces the previously issued test report on the same subject device for the same type of testing as indicated. Please discard or destroy the previously issued test report(s) and dispose of it accordingly.

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in §2.947. Test results reported herein relate only to the item(s) tested.

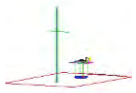
I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Randy Ortanez
President

ACCREDITED
CERT #2041.01

TABLE OF CONTENTS

PART 27 MEASUREMENT REPORT



Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	EIRP		Emission Designator
				Max. Power [W]	Max. Power [dBm]	
NR Band n77 (3700 - 3980MHz)	100 MHz	π/2 BPSK	3750.0 - 3930.0	0.060	17.79	96M9G7D
		QPSK	3750.0 - 3930.0	0.062	17.90	97M8G7D
		16QAM	3750.0 - 3930.0	0.035	15.39	97M8W7D
	90 MHz	π/2 BPSK	3745.0 - 3935.0	0.061	17.87	87M2G7D
		QPSK	3745.0 - 3935.0	0.062	17.94	87M7G7D
		16QAM	3745.0 - 3935.0	0.034	15.29	87M8W7D
	80 MHz	π/2 BPSK	3740.0 - 3940.0	0.064	18.07	77M4G7D
		QPSK	3740.0 - 3940.0	0.061	17.87	77M7G7D
		16QAM	3740.0 - 3940.0	0.033	15.23	77M8W7D
	70 MHz	π/2 BPSK	3735.0 - 3945.0	0.062	17.94	68M4G7D
		QPSK	3735.0 - 3945.0	0.045	16.55	67M7G7D
		16QAM	3735.0 - 3945.0	0.027	14.35	67M7W7D
	60 MHz	π/2 BPSK	3730.0 - 3950.0	0.061	17.85	58M5G7D
		QPSK	3730.0 - 3950.0	0.063	18.03	58M2G7D
		16QAM	3730.0 - 3950.0	0.032	15.11	58M2W7D
	50 MHz	π/2 BPSK	3725.0 - 3955.0	0.067	18.29	46M0G7D
		QPSK	3725.0 - 3955.0	0.068	18.35	48M0G7D
		16QAM	3725.0 - 3955.0	0.033	15.23	47M7W7D
	40 MHz	π/2 BPSK	3720.0 - 3960.0	0.068	18.34	35M8G7D
		QPSK	3720.0 - 3960.0	0.069	18.39	38M0G7D
		16QAM	3720.0 - 3960.0	0.036	15.51	38M0W7D
	30 MHz	π/2 BPSK	3715.0 - 3965.0	0.069	18.37	27M1G7D
		QPSK	3715.0 - 3965.0	0.070	18.45	28M0G7D
		16QAM	3715.0 - 3965.0	0.036	15.53	28M0W7D
	20 MHz	π/2 BPSK	3710.0 - 3970.0	0.070	18.45	18M0G7D
		QPSK	3710.0 - 3970.0	0.073	18.64	18M3G7D
		16QAM	3710.0 - 3970.0	0.036	15.58	18M3W7D

EUT Overview

1.0 INTRODUCTION

1.1 Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Innovation, Science and Economic Development Canada.

1.2 PCTEST Test Location

These measurement tests were conducted at the PCTEST Engineering Laboratory, Inc. facility located at 7185 Oakland Mills Road, Columbia, MD 21046. The measurement facility is compliant with the test site requirements specified in ANSI C63.4-2014.

1.3 Test Facility / Accreditations

Measurements were performed at PCTEST Engineering Lab located in Columbia, MD 21046, U.S.A.

- PCTEST is an ISO 17025-2017 accredited test facility under the American Association for Laboratory Accreditation (A2LA) with Certificate number 2041.01 for Specific Absorption Rate (SAR), Hearing Aid Compatibility (HAC) testing, where applicable, and Electromagnetic Compatibility (EMC) testing for FCC and Innovation, Science, and Economic Development Canada rules.

- PCTEST TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC 17065-2012 by A2LA (Certificate number 2041.03) in all scopes of FCC Rules and ISED Standards (RSS).

- PCTEST facility is a registered (2451B) test laboratory with the site description on file with ISED.

2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **SONY Portable Handset FCC ID:PY7-95324M**. The test data contained in this report pertains only to the emissions due to the EUT's licensed transmitters that operate under the provisions of Part 27.

Test Device Serial No.: 43745, 43844, 43869, 43786

2.2 Device Capabilities

This device contains the following capabilities:

850/1900 GSM/GPRS/EDGE, 850/1700/1900, WCDMA/HSPA, Multi-band LTE, Multi-band 5G NR , 802.11b/g/n/ax WLAN, 802.11a/n/ac/ax UNII, Bluetooth (1x, EDR, LE), NFC

2.3 Test Configuration

The EUT was tested per the guidance of ANSI/TIA-603-E-2016 and KDB 971168 D01 v03r01. See Section 0 of this test report for a description of the radiated and antenna port conducted emissions tests.

2.4 EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and no modifications were made during testing.

3.0 DESCRIPTION OF TESTS

3.1 Evaluation Procedure

The measurement procedures described in the "Land Mobile FM or PM – Communications Equipment – Measurements and Performance Standards" (ANSI/TIA-603-E-2016) and "Measurement Guidance for Certification of Licensed Digital Transmitters" (KDB 971168 D01 v03r01) were used in the measurement of the EUT.

Deviation from Measurement Procedure……..None

3.2 Radiated Power and Radiated Spurious Emissions

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. The test site inside the chamber is a 6m x 5.2m elliptical, obstruction-free area in accordance with Figure 5.7 of Clause 5 in ANSI C63.4-2014. Absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections for measurements above 1GHz. For measurements below 1GHz, the absorbers are removed. A raised turntable is used for radiated measurement. The turn table is a continuously rotatable, remote-controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. An 80cm tall test table made of Styrodur is placed on top of the turn table. A Styrodur pedestal is placed on top of the test table to bring the total table height to 1.5m.

The equipment under test was transmitting while connected to its integral antenna and is placed on a turntable 3 meters from the receive antenna. The receive antenna height is adjusted between 1 and 4 meter height, the turntable is rotated through 360 degrees, and the EUT is manipulated through all orthogonal planes representative of its typical use to achieve the highest reading on the receive spectrum analyzer.

For radiated power measurements, substitution method is used per the guidance of ANSI/TIA-603-E-2016. A half-wave dipole is substituted in place of the EUT. For emissions above 1GHz, a horn antenna is substituted in place of the EUT. The substitute antenna is driven by a signal generator with the level of the signal generator being adjusted to obtain the same receive spectrum analyzer level previously recorded from the spurious emission from the EUT. The power of the emission is calculated using the following formula:

$$P_{d\,[dBm]} = P_{g\,[dBm]} - \text{cable loss}_{\,[dB]} + \text{antenna gain}_{\,[dBd/dBi]};$$

where P_d is the dipole equivalent power, P_g is the generator output into the substitution antenna, and the antenna gain is the gain of the substitute antenna used relative to either a half-wave dipole (dBd) or an isotropic source (dBi). The substitute level is equal to $P_{g\,[dBm]}$ – cable loss $_{[dB]}$.

For radiated spurious emissions measurements and calculations, conversion method is used per the formulas in KDB 971168 Section 5.8.4. Field Strength (EIRP) is calculated using the following formulas:

$$E_{[dB\mu V/m]} = \text{Measured amplitude level}_{[dBm]} + 107 + \text{Cable Loss}_{[dB]} + \text{Antenna Factor}_{[dB/m]}$$

And

$$EIRP_{[dBm]} = E_{[dB\mu V/m]} + 20\log D - 104.8;$$ where D is the measurement distance in meters.

All radiated measurements are performed in a chamber that meets the site requirements per ANSI C63.4-2014. Additionally, radiated emissions below 30MHz are also validated on an Open Area Test Site to assert correlation with the chamber measurements per the requirements of KDB 414788 D01.

Radiated power and radiated spurious emission levels are investigated with the receive antenna horizontally and vertically polarized per ANSI/TIA-603-E-2016.

4.0 MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.4-2014. All measurement uncertainty values are shown with a coverage factor of k = 2 to indicate a 95% level of confidence. The measurement uncertainty shown below meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Contribution	Expanded Uncertainty (±dB)
Conducted Bench Top Measurements	1.13
Radiated Disturbance (<1GHz)	4.98
Radiated Disturbance (>1GHz)	5.07
Radiated Disturbance (>18GHz)	5.09

5.0 TEST EQUIPMENT CALIBRATION DATA

Test Equipment Calibration is traceable to the National Institute of Standards and Technology (NIST). Measurements antennas used during testing were calibrated in accordance to the requirements of ANSI C63.5-2017.

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
-	AP2	EMC Cable and Switch System	3/4/2021	Annual	3/4/2022	AP2
-	AP1	EMC Cable and Switch System	3/9/2021	Annual	3/9/2022	AP1
-	ETS	EMC Cable and Switch System	3/4/2021	Annual	3/4/2022	ETS
-	LTx1	Licensed Transmitter Cable Set	3/12/2021	Annual	3/12/2022	LTx1
-	LTx2	Licensed Transmitter Cable Set	3/12/2021	Annual	3/12/2022	LTx2
-	LTx3	LIcensed Transmitter Cable Set	2/26/2021	Annual	2/26/2022	LTx3
Anritsu	MT8821C	Radio Communication Analyzer	N/A			6201525694
Com-Power	AL-130	9kHz - 30MHz Loop Antenna	10/10/2019	Biennial	10/10/2021	121034
Emco	3115	Horn Antenna (1-18GHz)	6/18/2020	Biennial	6/18/2022	9704-5182
Espec	ESX-2CA	Environmental Chamber	8/27/2020	Annual	8/27/2022	17620
ETS Lindgren	3117	1-18 GHz DRG Horn (Medium)	4/20/2021	Biennial	4/20/2023	00125518
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	3/12/2020	Biennial	3/12/2022	128337
ETS Lindgren	3816/2NM	LISN	7/9/2020	Biennial	7/9/2022	00114451
Keysight Technologies	N9020A	MXA Signal Analyzer	9/22/2020	Annual	9/22/2021	MY54500644
Mini-Circuits	SSG-4000HP	Synthesized Signal Generator	N/A			11208010032
Mini-Circuits	SSG-4000HP	Synthesized Signal Generator	N/A			11403100002
Rohde & Schwarz	CMW500	Radio Communication Tester	N/A			100976
Rohde & Schwarz	CMW500	Radio Communication Tester	N/A			112347
Rohde & Schwarz	ESW44	EMI Test Receiver 2Hz to 44 GHz	1/21/2021	Annual	1/21/2022	101716
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	7/27/2020	Biennial	7/27/2022	A051107
Sunol	JB6	LB6 Antenna	11/13/2020	Biennial	11/13/2022	A082816

Table 5-1. Test Equipment

Notes:

1. For equipment listed above that has a calibration date or calibration due date that falls within the test date range, care was taken to ensure that this equipment was used after the calibration date and before the calibration due date.

2. Equipment with a calibration date of “N/A” shown in this list was not used to make direct calibrated measurements.

6.0 SAMPLE CALCULATIONS

QPSK Modulation

Emission Designator = 8M62G7D
LTE BW = 8.62 MHz
G = Phase Modulation
7 = Quantized/Digital Info
D = Data transmission, telemetry, telecommand

QAM Modulation

Emission Designator = 8M45W7D
LTE BW = 8.45 MHz
W = Amplitude/Angle Modulated
7 = Quantized/Digital Info
D = Data transmission, telemetry, telecommand

Spurious Radiated Emission

Example: Spurious emission at 3700.40 MHz

The receive spectrum analyzer reading at 3 meters with the EUT on the turntable was –81.0 dBm. The gain of the substituted antenna is 8.1 dBi. The signal generator connected to the substituted antenna terminals is adjusted to produce a reading of –81.0 dBm on the spectrum analyzer. The loss of the cable between the signal generator and the terminals of the substituted antenna is 2.0 dB at 3700.40 MHz. So 6.1 dB is added to the signal generator reading of –30.9 dBm yielding –24.80 dBm. The fundamental EIRP was 25.50 dBm so this harmonic was 25.50 dBm – (-24.80) = 50.3 dBc.

7.0 TEST RESULTS

7.1 Summary

Company Name: SONY Corporation

FCC ID: PY7-95324M

FCC Classification: PCS Licensed Transmitter Held to Ear (PCE)

Mode(s): NR

Test Condition	Test Description	FCC Part Section(s)	Test Limit	Test Result	Reference
CONDUCTED	Transmitter Conducted Output Power	2.1046(a), 2.1046(c)	N/A	PASS	Section 7.2
	Occupied Bandwidth	2.1049(h)	N/A	PASS	Section 7.3
	Conducted Band Edge / Spurious Emissions (NR Band n77)	2.1051, 27.53(l), 27.53(n)	≤ 13 dBm / MHz	PASS	Sections 7.4, 7.5
	Peak-to-Average Ratio (NR Band n77)	27.53(j)(4), 27.53(k)(4)	≤ 13 dB	PASS	Section 7.6
	Frequency Stability	2.1055, 27.54	Fundamental emissions stay within authorized frequency block.	PASS	Section 7.9
RADIATED	Effective Radiated Power / Equivalent Isotropic Radiated Power (NR Band n77)	27.53(j)(3), 27.53(k)(3)	≤ 1 Watt EIRP	PASS	Section 7.7
	Radiated Spurious Emissions (NR Band n77)	2.1053, 27.53(l), 27.53(n)	≤ 13 dBm / MHz	PASS	Section 7.8

Table 7-1. Summary of Test Results (FCC)

Notes:

1) All modes of operation and data rates were investigated. The test results shown in the following sections represent the worst case emissions.
2) The analyzer plots were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables, directional couplers, and attenuators used as part of the system to maintain a link between the call box and the EUT at all frequencies of interest.
3) All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables, attenuators, and couplers.
4) All conducted emissions measurements are performed with automated test software to capture the corresponding plots necessary to show compliance. The measurement software utilized is PCTEST EMC Software Tool v1.0.

7.2 Occupied Bandwidth

Test Overview

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured. All modes of operation were investigated and the worst case configuration results are reported in this section.

Test Procedure Used

KDB 971168 D01 v03r01 – Section 4.2

Test Settings

1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 99% occupied bandwidth and the 26dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = 1 – 5% of the expected OBW
3. VBW ≥ 3 x RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. The trace was allowed to stabilize
8. If necessary, steps 2 – 7 were repeated after changing the RBW such that it would be within 1 – 5% of the 99% occupied bandwidth observed in Step 7

Test Setup

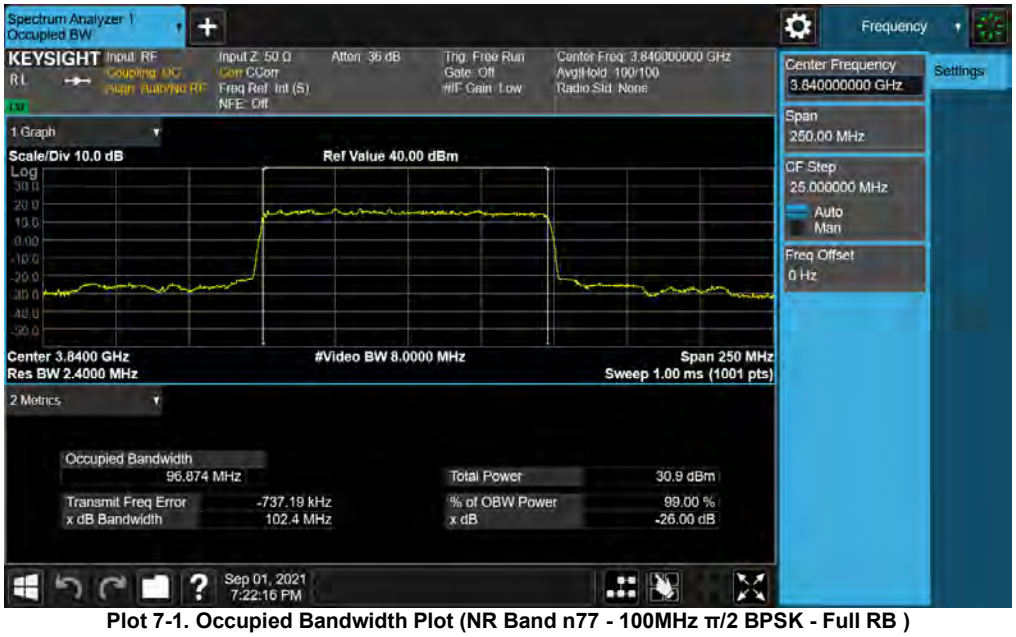
The EUT and measurement equipment were set up as shown in the diagram below.

Figure 7-1. Test Instrument & Measurement Setup

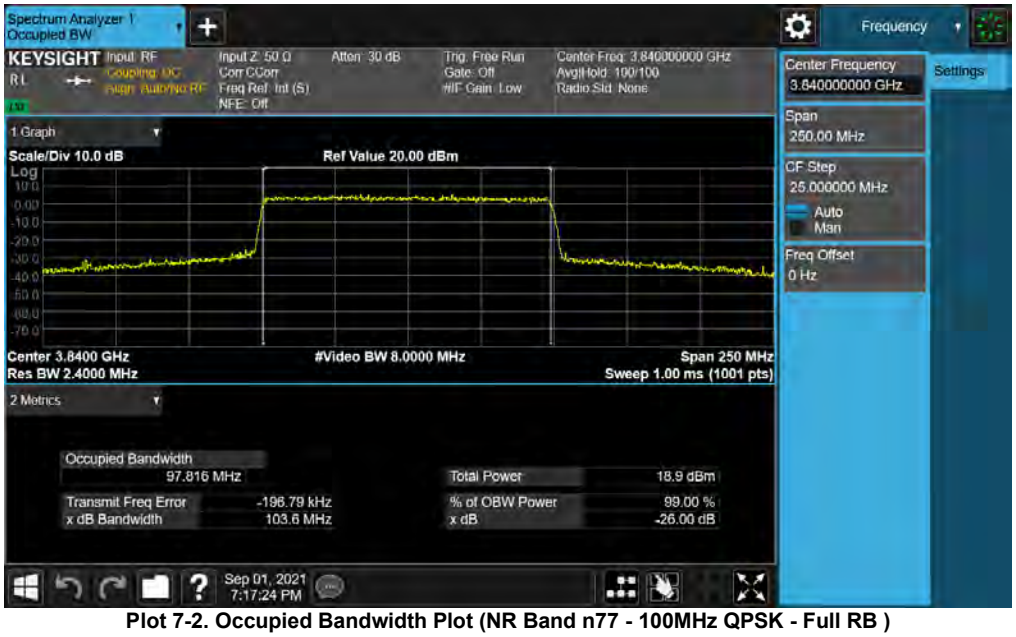
Test Notes

None.

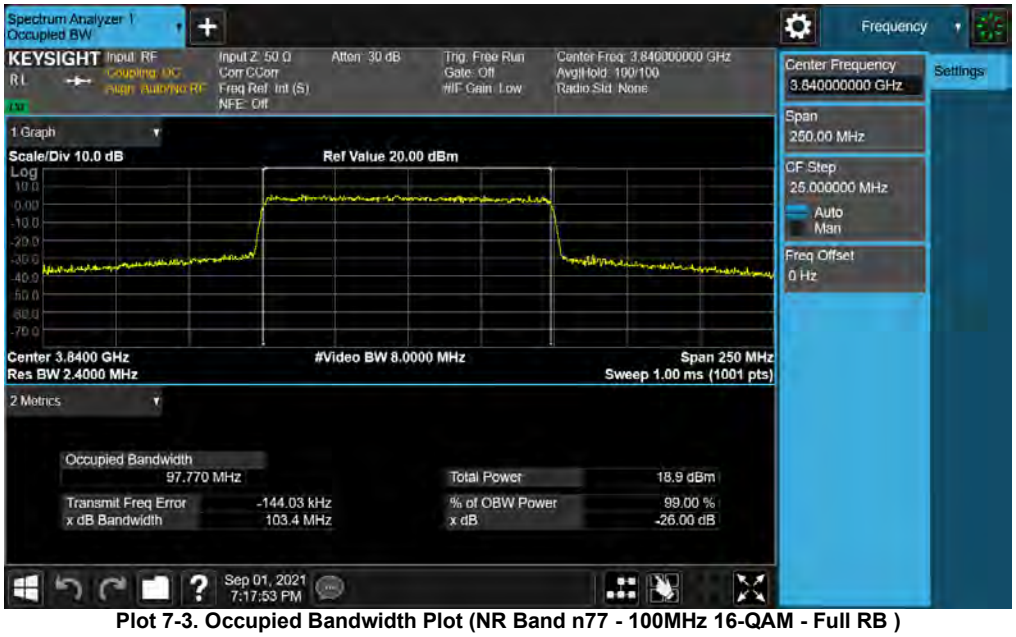
NR Band n77 – MAIN Antenna



Plot 7-1. Occupied Bandwidth Plot (NR Band n77 - 100MHz π/2 BPSK - Full RB)

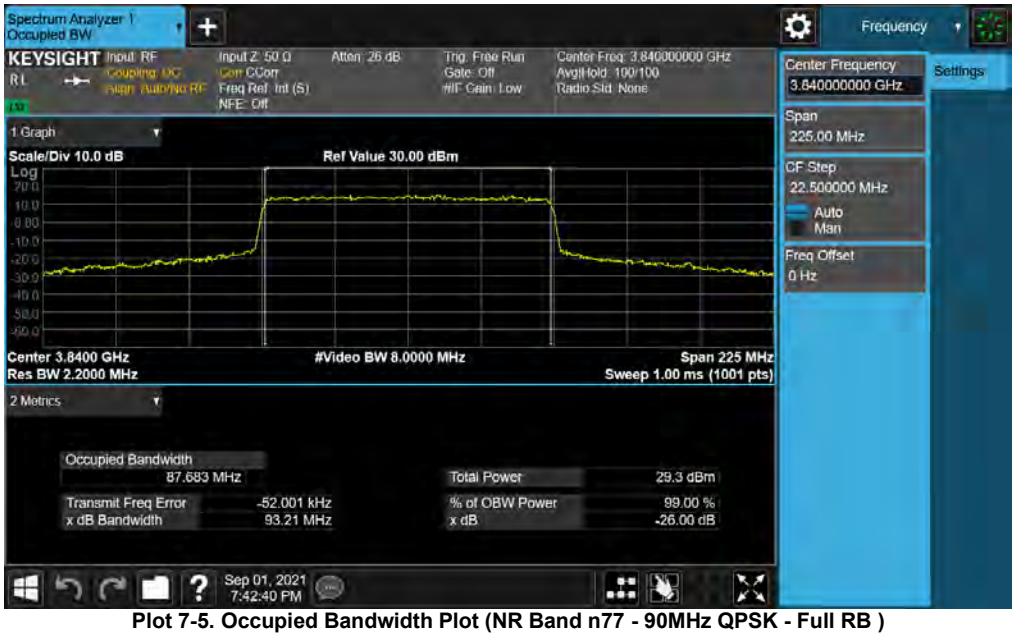


Plot 7-2. Occupied Bandwidth Plot (NR Band n77 - 100MHz QPSK - Full RB)



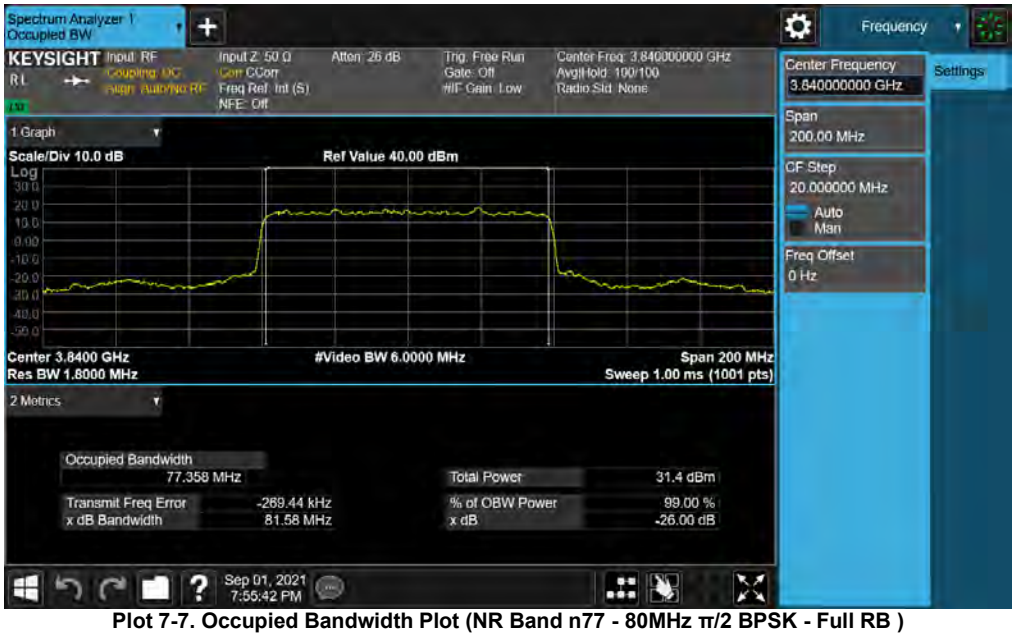
Plot 7-3. Occupied Bandwidth Plot (NR Band n77 - 100MHz 16-QAM - Full RB)

Plot 7-4. Occupied Bandwidth Plot (NR Band n77 - 90MHz π/2 BPSK - Full RB)



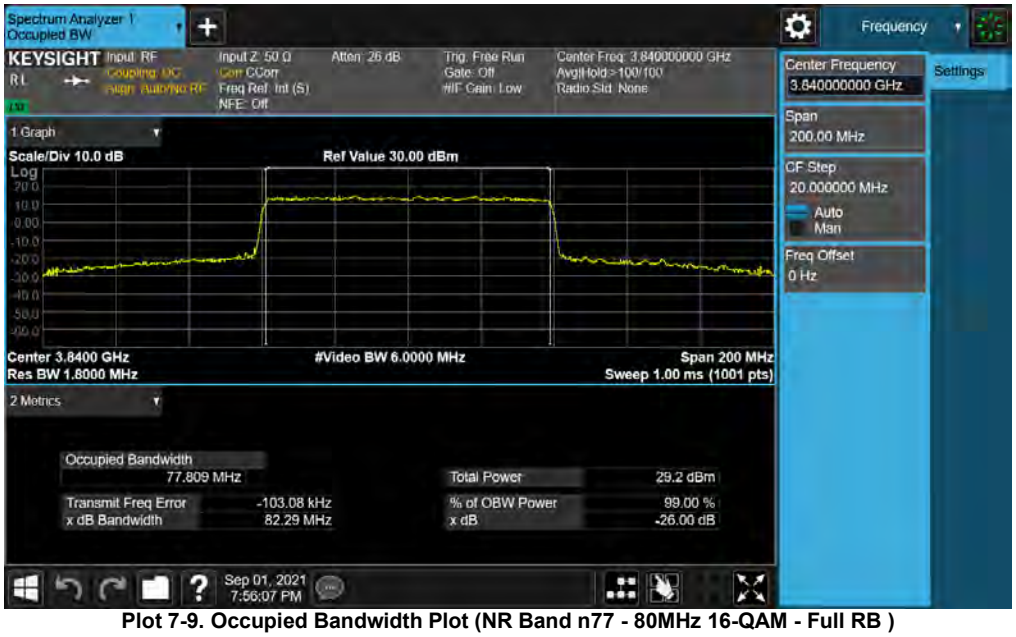
Plot 7-5. Occupied Bandwidth Plot (NR Band n77 - 90MHz QPSK - Full RB)

Plot 7-6. Occupied Bandwidth Plot (NR Band n77 - 90MHz 16-QAM - Full RB)

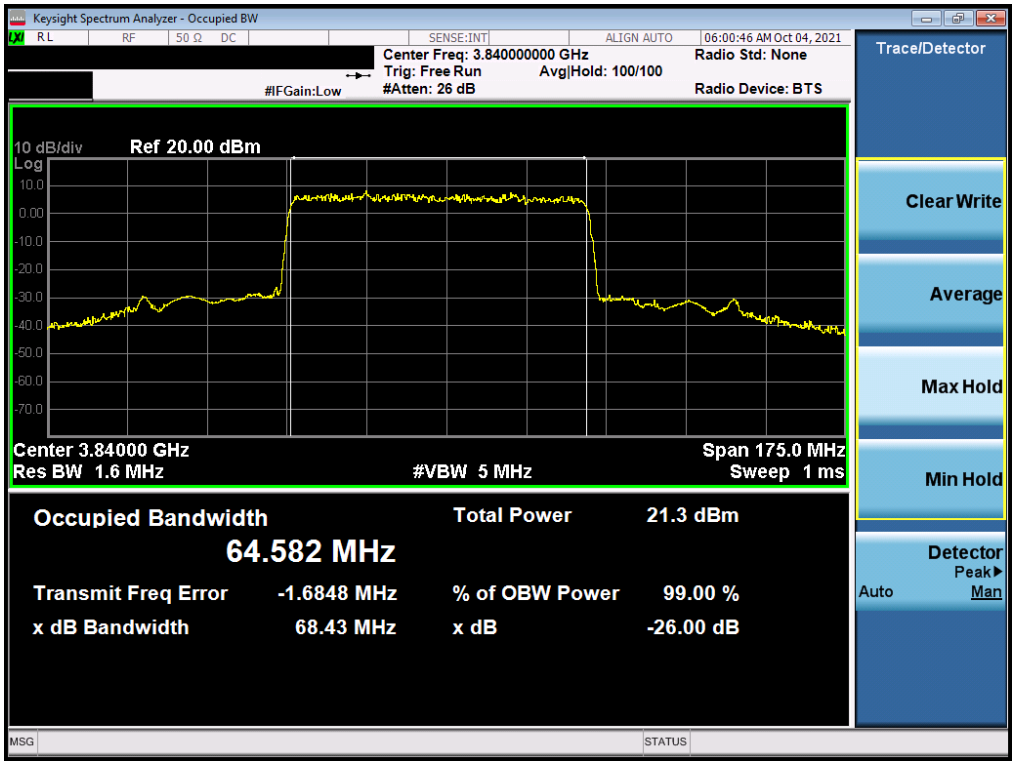


Plot 7-7. Occupied Bandwidth Plot (NR Band n77 - 80MHz π/2 BPSK - Full RB)

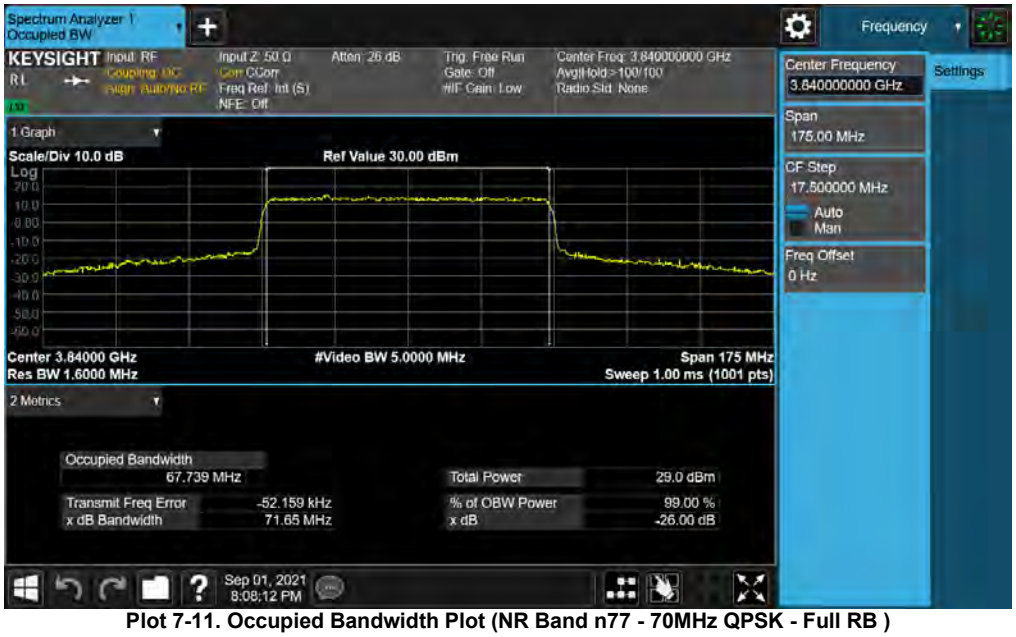
Plot 7-8. Occupied Bandwidth Plot (NR Band n77 - 80MHz QPSK - Full RB)



Plot 7-9. Occupied Bandwidth Plot (NR Band n77 - 80MHz 16-QAM - Full RB)

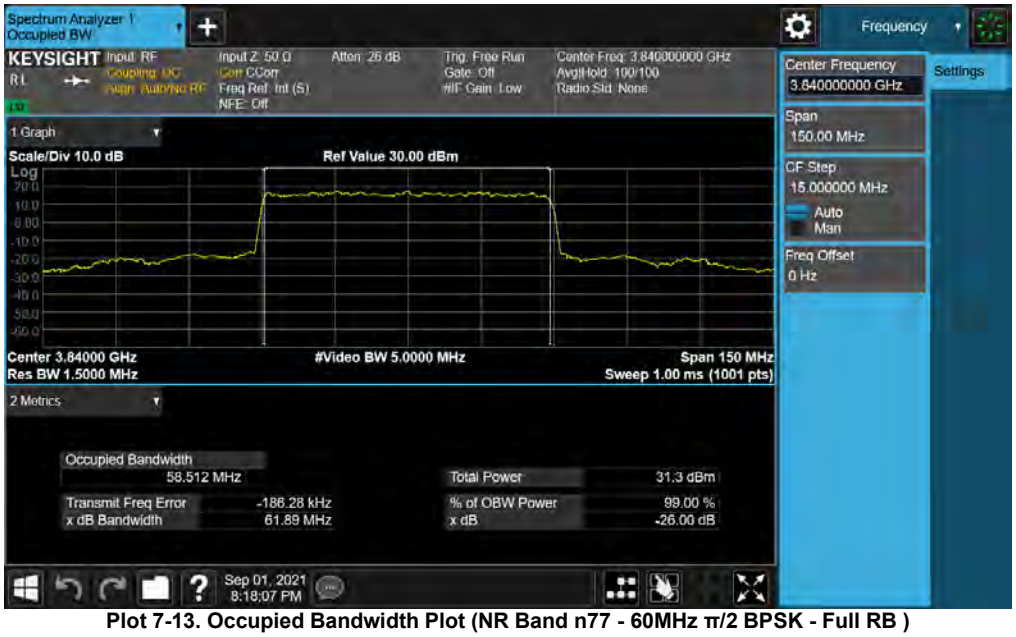


Plot 7-10. Occupied Bandwidth Plot (NR Band n77 - 70MHz BPSK - Full RB)

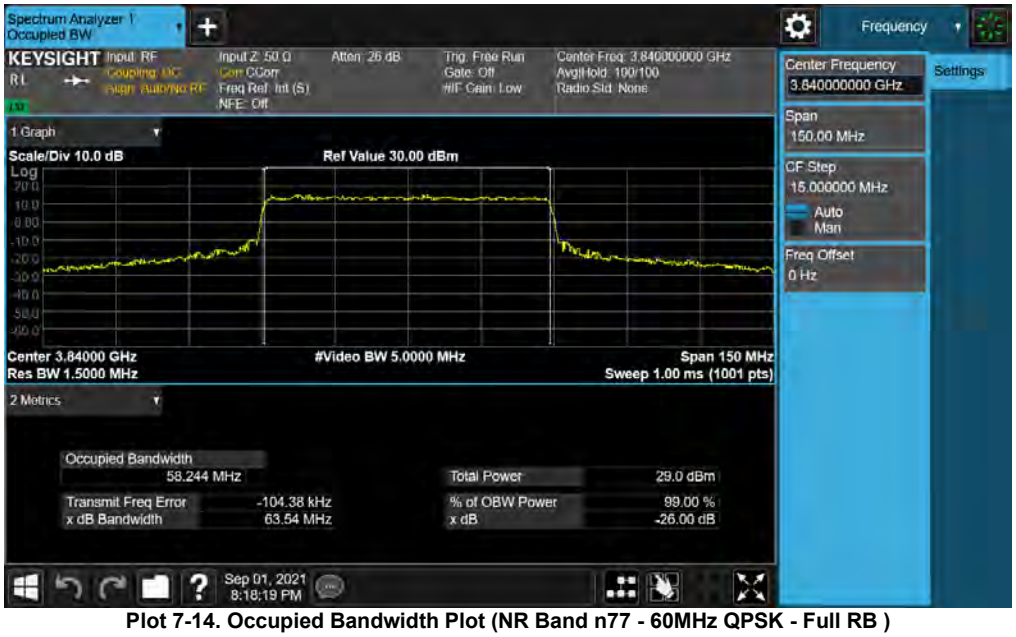


Plot 7-11. Occupied Bandwidth Plot (NR Band n77 - 70MHz QPSK - Full RB)

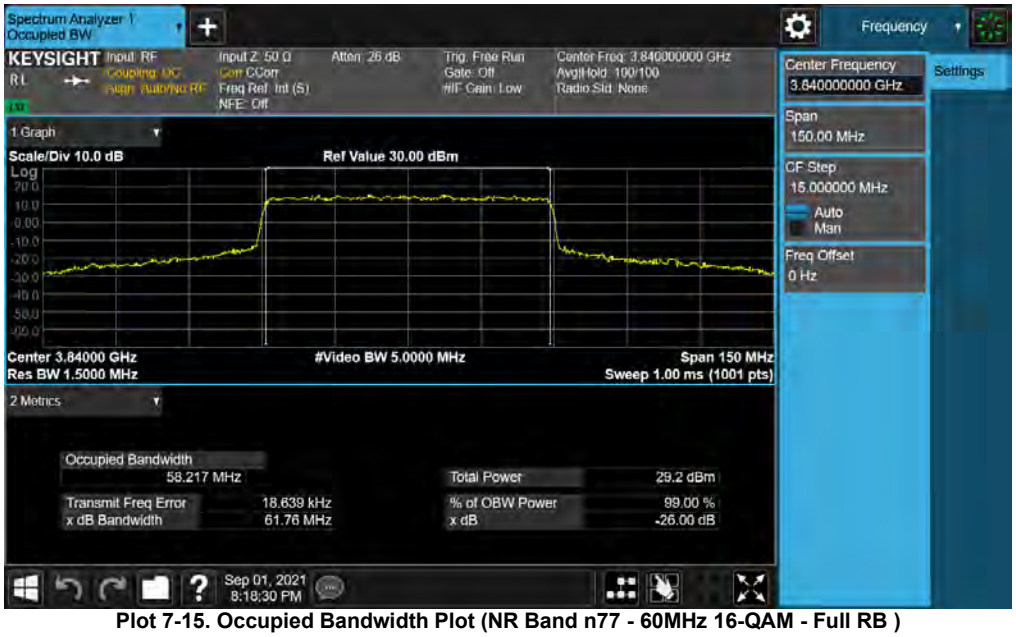
Plot 7-12. Occupied Bandwidth Plot (NR Band n77 - 70MHz 16-QAM - Full RB)



Plot 7-13. Occupied Bandwidth Plot (NR Band n77 - 60MHz π/2 BPSK - Full RB)

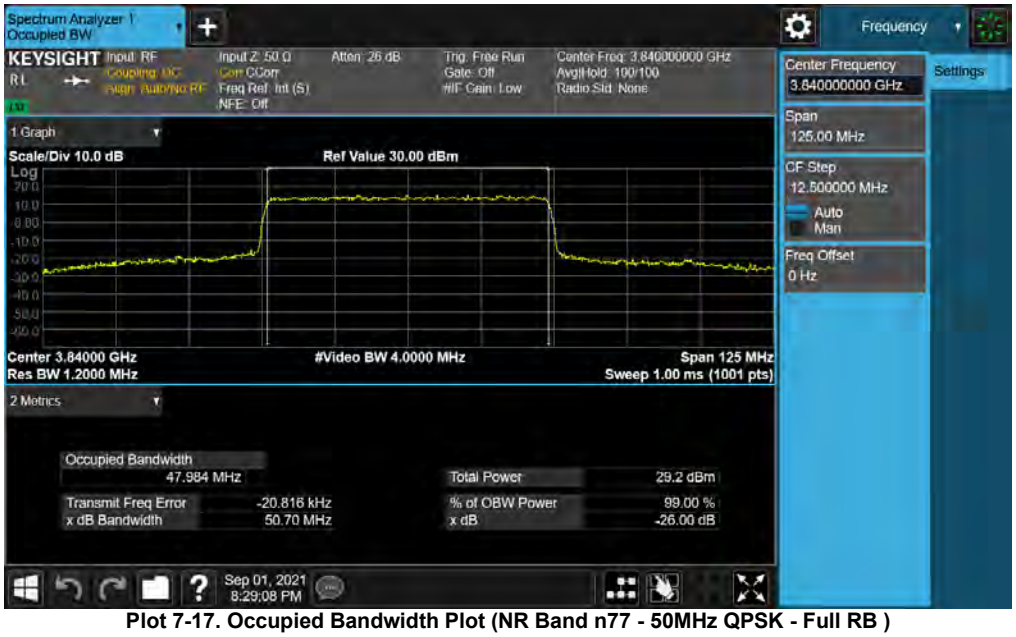


Plot 7-14. Occupied Bandwidth Plot (NR Band n77 - 60MHz QPSK - Full RB)



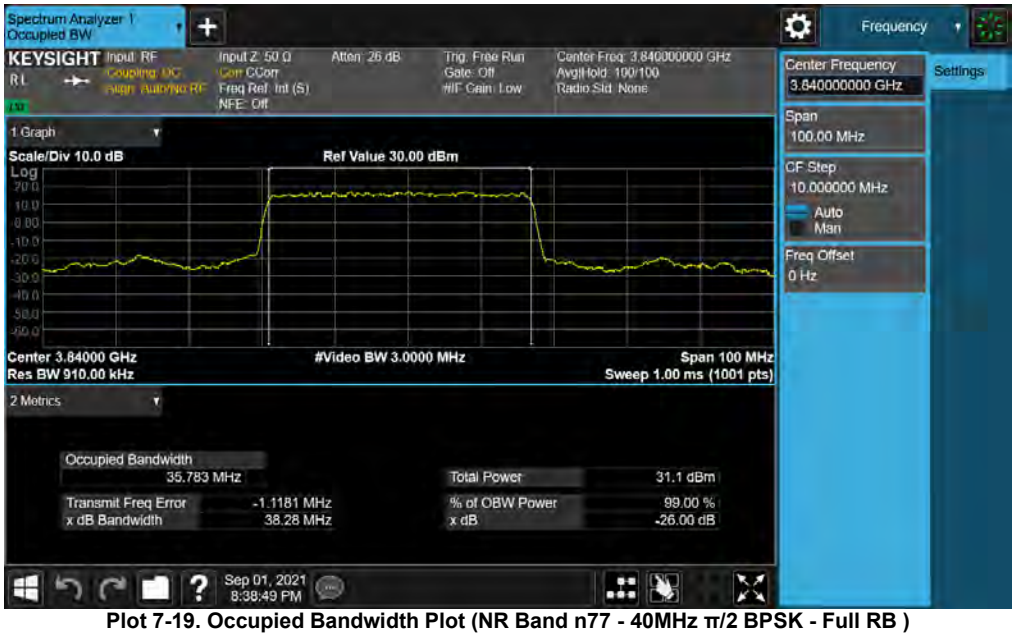
Plot 7-15. Occupied Bandwidth Plot (NR Band n77 - 60MHz 16-QAM - Full RB)

Plot 7-16. Occupied Bandwidth Plot (NR Band n77 - 50MHz π/2 BPSK - Full RB)



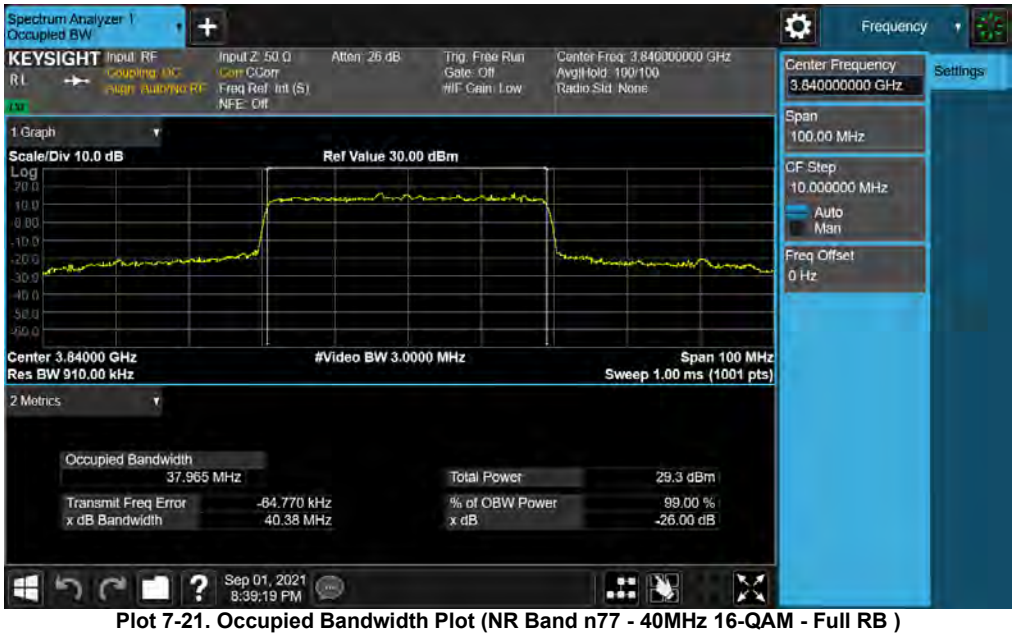
Plot 7-17. Occupied Bandwidth Plot (NR Band n77 - 50MHz QPSK - Full RB)

Plot 7-18. Occupied Bandwidth Plot (NR Band n77 - 50MHz 16-QAM - Full RB)



Plot 7-19. Occupied Bandwidth Plot (NR Band n77 - 40MHz π/2 BPSK - Full RB)

Plot 7-20. Occupied Bandwidth Plot (NR Band n77 - 40MHz QPSK - Full RB)



Plot 7-21. Occupied Bandwidth Plot (NR Band n77 - 40MHz 16-QAM - Full RB)

Plot 7-22. Occupied Bandwidth Plot (NR Band n77 - 30MHz π/2 BPSK - Full RB)

Plot 7-23. Occupied Bandwidth Plot (NR Band n77 - 30MHz QPSK - Full RB)

Plot 7-24. Occupied Bandwidth Plot (NR Band n77 - 30MHz 16-QAM - Full RB)

Plot 7-25. Occupied Bandwidth Plot (NR Band n77 - 20MHz π/2 BPSK - Full RB)

Plot 7-26. Occupied Bandwidth Plot (NR Band n77 - 20MHz QPSK - Full RB)

Plot 7-27. Occupied Bandwidth Plot (NR Band n77 - 20MHz 16-QAM - Full RB)

7.3 Spurious and Harmonic Emissions at Antenna Terminal

Test Overview

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

The minimum permissible attenuation level of any spurious emission is 43 + 10 $log_{10}(P_{[Watts]})$, where P is the transmitter power in Watts.

Test Procedure Used

KDB 971168 D01 v03r01 – Section 6.0

Test Settings

1. Start frequency was set to 30MHz and stop frequency was set to 10GHz (separated into at least two plots per channel)
2. Detector = RMS
3. Trace mode = trace average for continuous emissions, max hold for pulse emissions
4. Sweep time = auto couple
5. The trace was allowed to stabilize
6. Please see test notes below for RBW and VBW settings

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

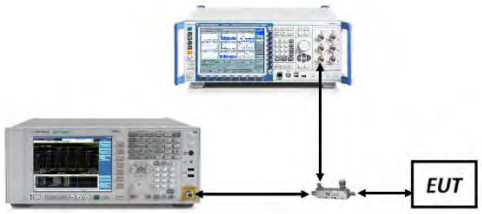


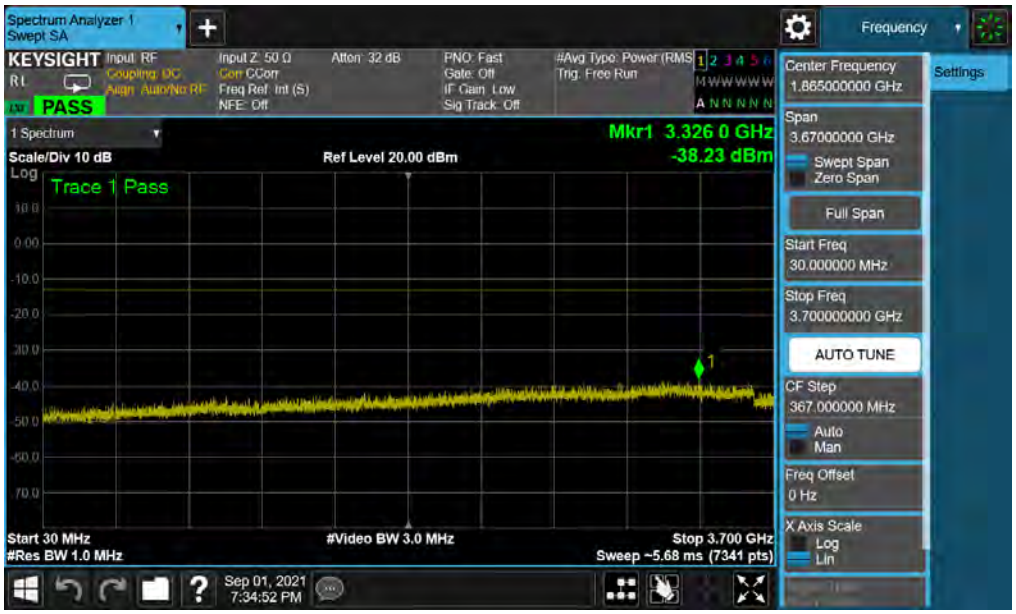
Figure 7-2. Test Instrument & Measurement Setup

Test Notes

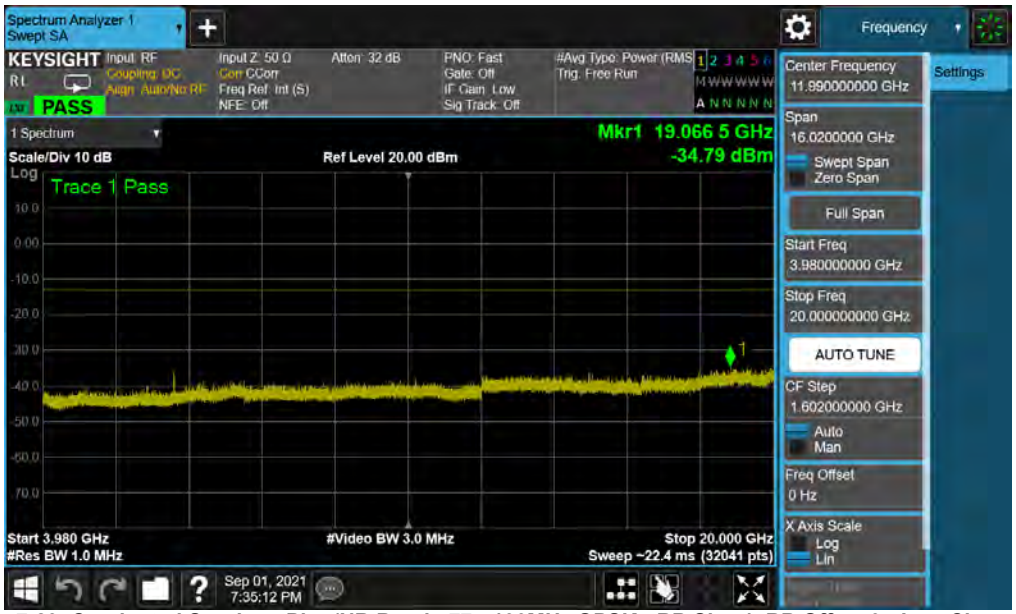
1. Per Part 27 and RSS-199, compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth 100 kHz or greater for measurements below 1GHz. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. 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 emission are attenuated at least 26 dB below the transmitter power.

2. For NR operation, all subcarrier spacings (SCS) and transmission schemes (e.g. CP-OFDM and DFT-s-OFDM) were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

NR Band n77 – MAIN Antenna

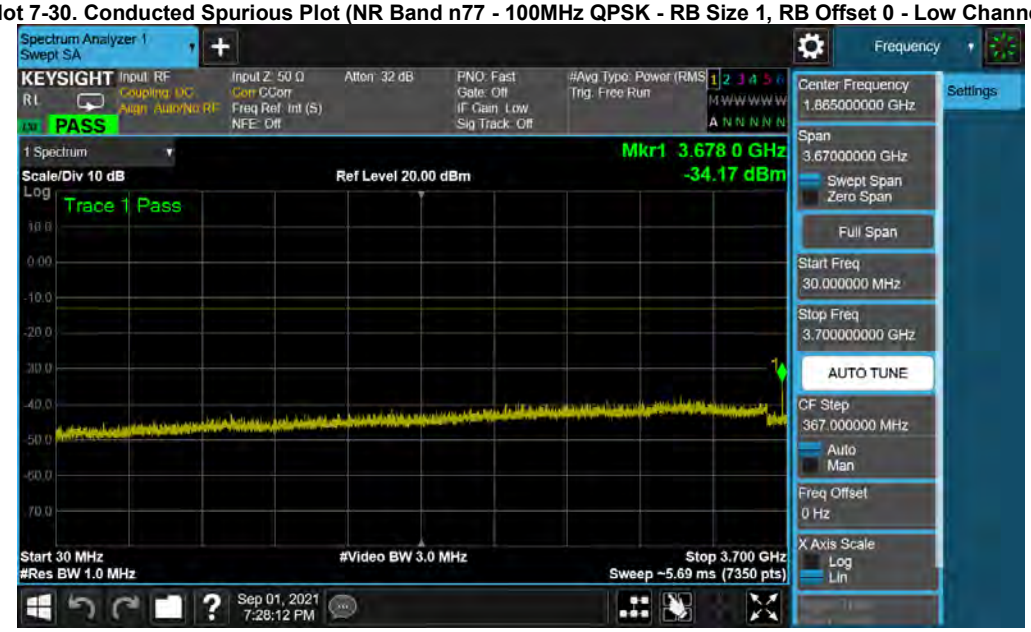


Plot 7-28. Conducted Spurious Plot (NR Band n77 - 100MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

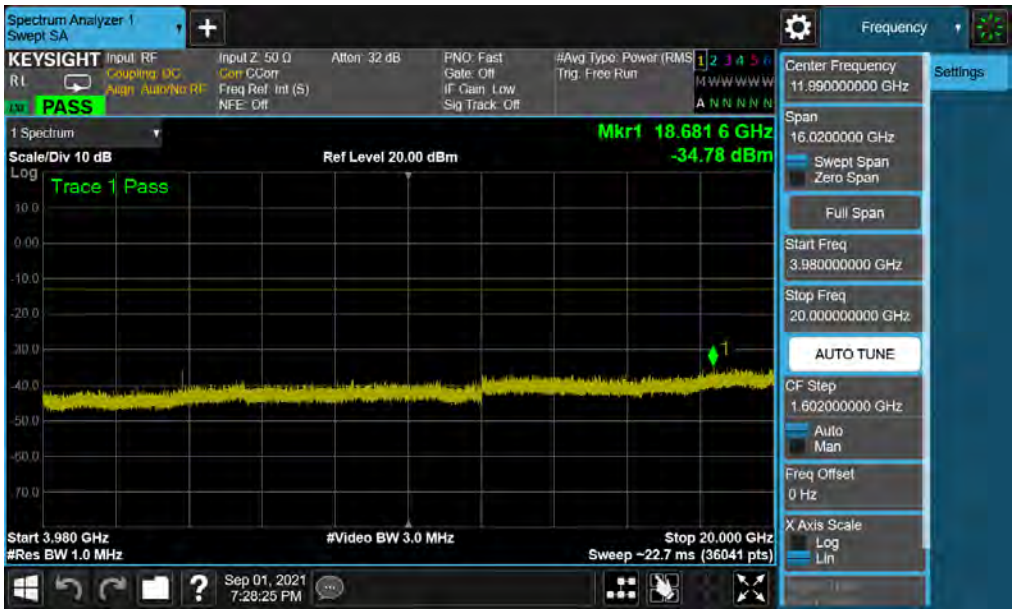


Plot 7-29. Conducted Spurious Plot (NR Band n77 - 100MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

Plot 7-30. Conducted Spurious Plot (NR Band n77 - 100MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

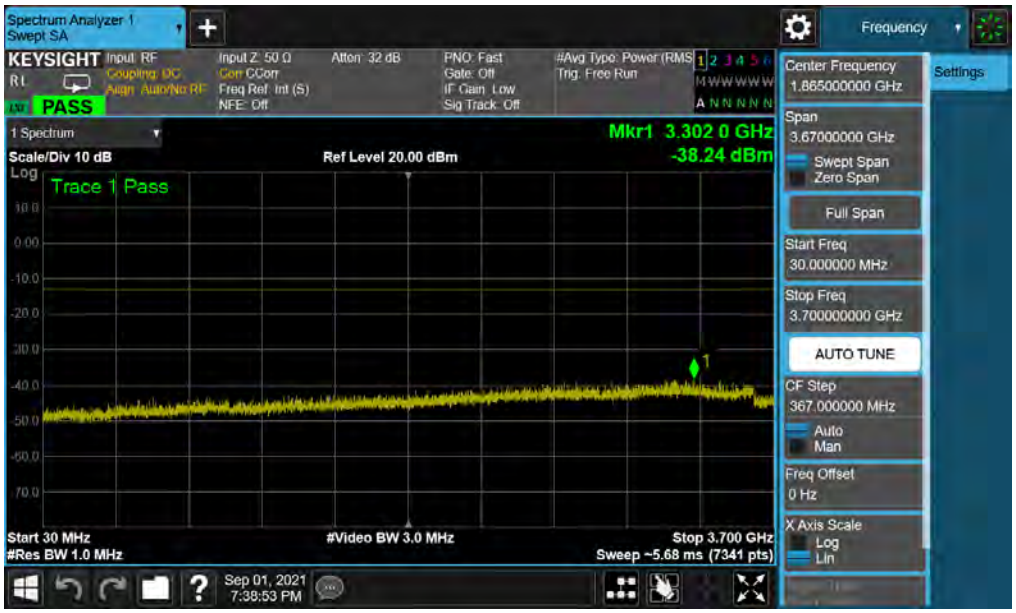


Plot 7-31. Conducted Spurious Plot (NR Band n77 - 100MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

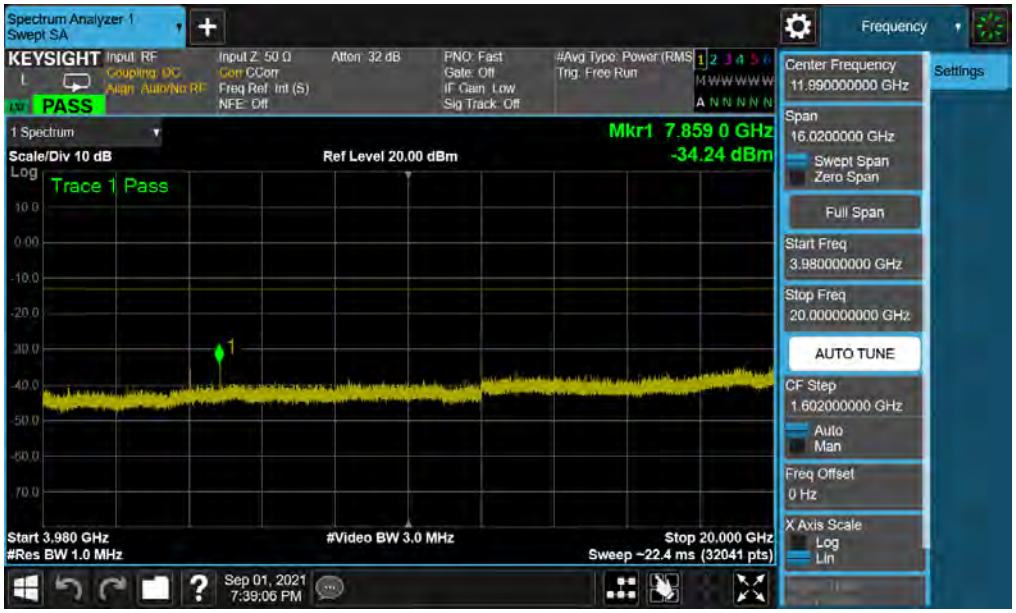


Plot 7-32. Conducted Spurious Plot (NR Band n77 - 100MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

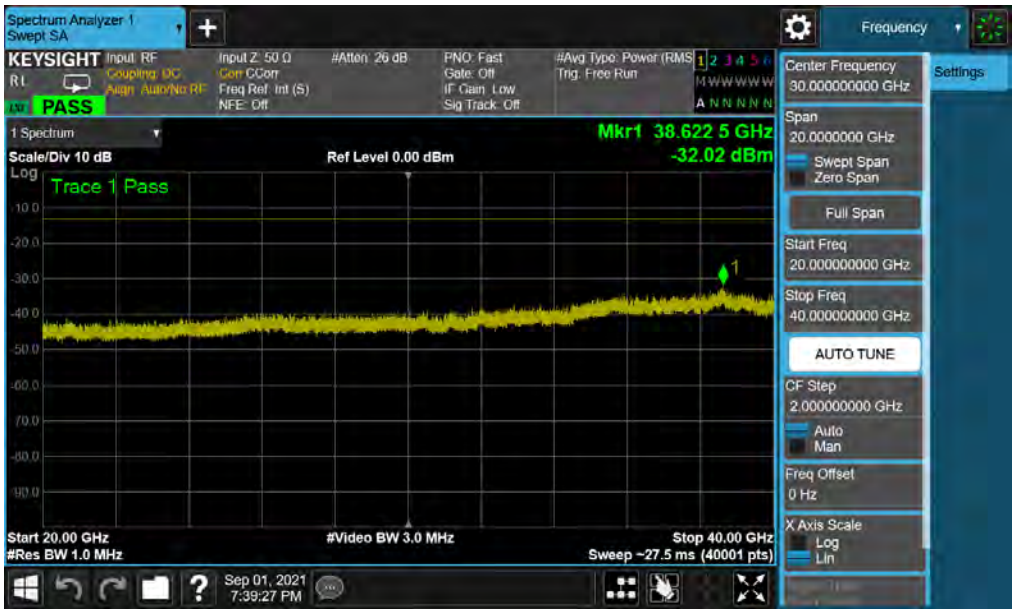
Plot 7-33. Conducted Spurious Plot (NR Band n77 - 100MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)



Plot 7-34. Conducted Spurious Plot (NR Band n77 - 100MHz QPSK - RB Size 1, RB Offset 0 - High Channel)



Plot 7-35. Conducted Spurious Plot (NR Band n77 - 100MHz QPSK - RB Size 1, RB Offset 0 - High Channel)



Plot 7-36. Conducted Spurious Plot (NR Band n77 - 100MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

7.4 Band Edge Emissions at Antenna Terminal

Test Overview

All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

The minimum permissible attenuation level of any spurious emission is 43 + 10 $log_{10}(P_{[Watts]})$, where P is the transmitter power in Watts.

Test Procedure Used

KDB 971168 D01 v03r01 – Section 6.0

Test Settings

1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. RBW ≥ 1% of the emission bandwidth
4. VBW ≥ 3 x RBW
5. Detector = RMS
6. Number of sweep points ≥ 2 x Span/RBW
7. Trace mode = trace average for continuous emissions, max hold for pulse emissions
8. Sweep time = auto couple
9. The trace was allowed to stabilize

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

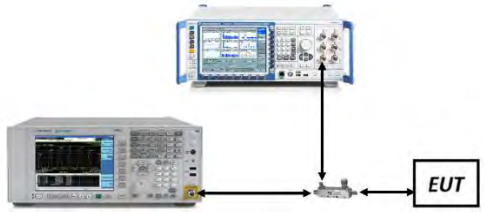


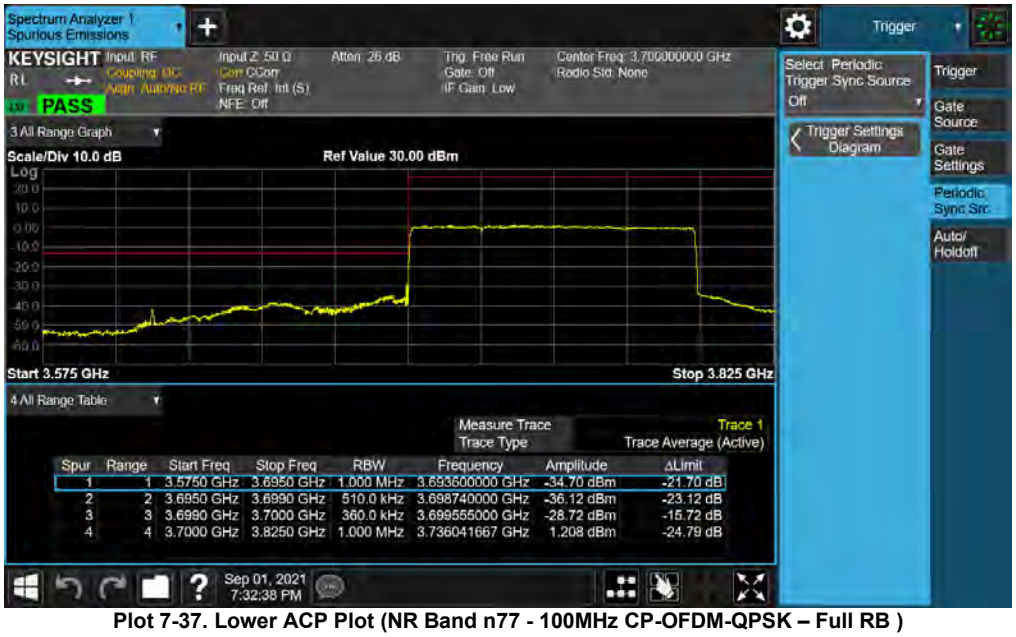
Figure 7-3. Test Instrument & Measurement Setup

Test Notes

1. Per 27.53(h), in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to demonstrate compliance with the out-of-band emissions limit. 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 emission are attenuated at least 26 dB below the transmitter power.

2. For NR operation, all subcarrier spacings (SCS) and transmission schemes (e.g. CP-OFDM and DFT-s-OFDM) were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

NR Band n77 – MAIN Antenna



Plot 7-37. Lower ACP Plot (NR Band n77 - 100MHz CP-OFDM-QPSK – Full RB)

Plot 7-38. Upper ACP Plot (NR Band n77 - 100MHz CP-OFDM-QPSK – Full RB)

Plot 7-39. Lower ACP Plot (NR Band n77 - 90MHz CP-OFDM-QPSK – Full RB)

Plot 7-40. Upper ACP Plot (NR Band n77 - 90MHz CP-OFDM-QPSK – Full RB)

Plot 7-41. Lower ACP Plot (NR Band n77 - 80MHz CP-OFDM-QPSK – Full RB)

Plot 7-42. Upper ACP Plot (NR Band n77 - 80MHz CP-OFDM-QPSK – Full RB)

Plot 7-43. Lower ACP Plot (NR Band n77 - 70MHz CP-OFDM-QPSK – Full RB)

Plot 7-44. Upper ACP Plot (NR Band n77 - 70MHz CP-OFDM-QPSK – Full RB)

Plot 7-45. Lower ACP Plot (NR Band n77 - 60MHz CP-OFDM-QPSK – Full RB)

Plot 7-46. Upper ACP Plot (NR Band n77 - 60MHz CP-OFDM-QPSK – Full RB)

Plot 7-47. Lower ACP Plot (NR Band n77 - 50MHz CP-OFDM-QPSK – Full RB)

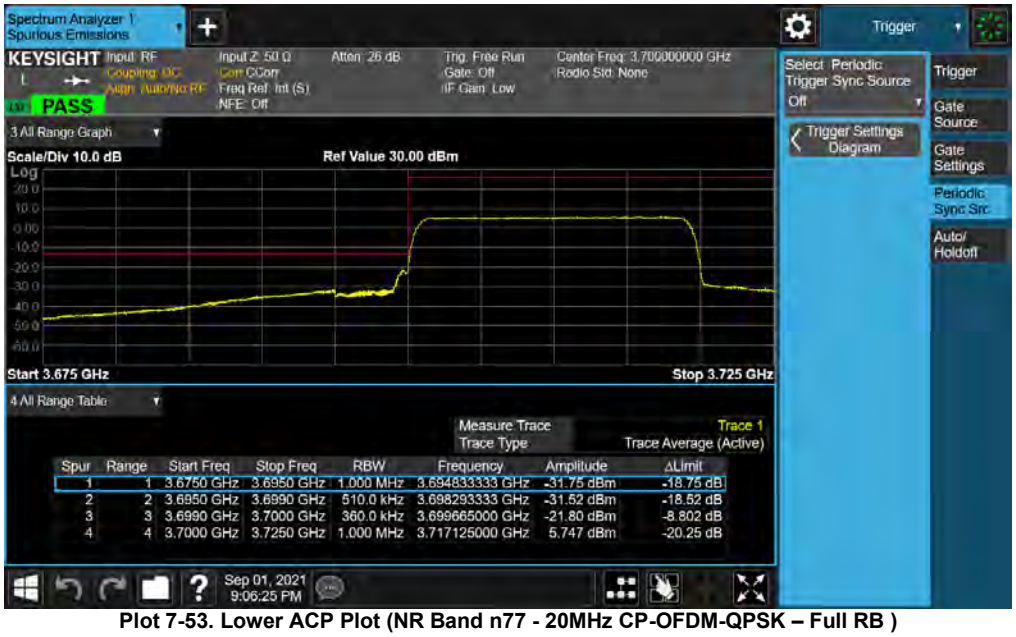
Plot 7-48. Upper ACP Plot (NR Band n77 - 50MHz CP-OFDM-QPSK – Full RB)

Plot 7-49. Lower ACP Plot (NR Band n77 - 40MHz CP-OFDM-QPSK – Full RB)

Plot 7-50. Upper ACP Plot (NR Band n77 - 40MHz CP-OFDM-QPSK – Full RB)

Plot 7-51. Lower ACP Plot (NR Band n77 - 30MHz CP-OFDM-QPSK – Full RB)

Plot 7-52. Upper ACP Plot (NR Band n77 - 30MHz CP-OFDM-QPSK – Full RB)



Plot 7-53. Lower ACP Plot (NR Band n77 - 20MHz CP-OFDM-QPSK – Full RB)

Plot 7-54. Upper ACP Plot (NR Band n77 - 20MHz CP-OFDM-QPSK – Full RB)

7.5 Peak-Average Ratio

Test Overview

A peak to average ratio measurement is performed at the conducted port of the EUT. The spectrum analyzers Complementary Cumulative Distribution Function (CCDF) measurement profile is used to determine the largest deviation between the average and the peak power of the EUT in a given bandwidth. The CCDF curve shows how much time the peak waveform spends at or above a given average power level. The percent of time the signal spends at or above the level defines the probability for that particular power level.

Test Procedure Used

KDB 971168 D01 v03r01 – Section 5.7.1

Test Settings

1. The signal analyzer's CCDF measurement profile is enabled
2. Frequency = carrier center frequency
3. Measurement BW ≥ OBW or specified reference bandwidth
4. The signal analyzer was set to collect one million samples to generate the CCDF curve
5. The measurement interval was set depending on the type of signal analyzed. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms. For burst transmissions, the spectrum analyzer is set to use an internal "RF Burst" trigger that is synced with an incoming pulse and the measurement interval is set to less than the duration of the "on time" of one burst to ensure that energy is only captured during a time in which the transmitter is operating at maximum power

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

Figure 7-4. Test Instrument & Measurement Setup

Test Notes

None.

NR Band n77 – MAIN Antenna

Plot 7-55. PAR Plot (NR Band n77 - 100MHz DFT-s-OFDM BPSK - Full RB)

Plot 7-56. PAR Plot (NR Band n77 - 100MHz CP-OFDM QPSK - Full RB)

Plot 7-57. PAR Plot (NR Band n77 - 100MHz CP-OFDM 256-QAM - Full RB)

Plot 7-58. PAR Plot (NR Band n77 - 90MHz DFT-s-OFDM BPSK - Full RB)

Plot 7-59. PAR Plot (NR Band n77 - 90MHz CP-OFDM QPSK - Full RB)

Plot 7-60. PAR Plot (NR Band n77 - 90MHz CP-OFDM 256-QAM - Full RB)

Plot 7-61. PAR Plot (NR Band n77 - 80MHz DFT-s-OFDM BPSK - Full RB)

Plot 7-62. PAR Plot (NR Band n77 - 80MHz CP-OFDM QPSK - Full RB)

Plot 7-63. PAR Plot (NR Band n77 - 80MHz CP-OFDM 256-QAM - Full RB)

Plot 7-64. PAR Plot (NR Band n77 - 70MHz CP-OFDM QPSK - Full RB)

Plot 7-65. PAR Plot (NR Band n77 - 70MHz CP-OFDM 256-QAM - Full RB)

Plot 7-66. PAR Plot (NR Band n77 - 60MHz DFT-s-OFDM BPSK - Full RB)

Plot 7-67. PAR Plot (NR Band n77 - 60MHz CP-OFDM QPSK - Full RB)

Plot 7-68. PAR Plot (NR Band n77 - 60MHz CP-OFDM 256-QAM - Full RB)

Plot 7-69. PAR Plot (NR Band n77 - 50MHz DFT-s-OFDM BPSK - Full RB)

Plot 7-70. PAR Plot (NR Band n77 - 50MHz CP-OFDM QPSK - Full RB)

Plot 7-71. PAR Plot (NR Band n77 - 50MHz CP-OFDM 256-QAM - Full RB)

Plot 7-72. PAR Plot (NR Band n77 - 40MHz DFT-s-OFDM BPSK - Full RB)

Plot 7-73. PAR Plot (NR Band n77 - 40MHz CP-OFDM QPSK - Full RB)

Plot 7-74. PAR Plot (NR Band n77 - 40MHz CP-OFDM 256-QAM - Full RB)

Plot 7-75. PAR Plot (NR Band n77 - 30MHz DFT-s-OFDM BPSK - Full RB)

Plot 7-76. PAR Plot (NR Band n77 - 30MHz CP-OFDM QPSK - Full RB)

Plot 7-77. PAR Plot (NR Band n77 - 30MHz CP-OFDM 256-QAM - Full RB)

Plot 7-78. PAR Plot (NR Band n77 - 20MHz DFT-s-OFDM BPSK - Full RB)

Plot 7-79. PAR Plot (NR Band n77 - 20MHz CP-OFDM QPSK - Full RB)

Plot 7-80. PAR Plot (NR Band n77 - 20MHz CP-OFDM 256-QAM - Full RB)

7.6 Radiated Power (EIRP)

Test Overview

Equivalent Isotropic Radiated Power (EIRP) measurements are performed using the substitution method described in ANSI/TIA-603-E-2016 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically and horizontally polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as RMS average measurements while the EUT is operating at maximum power, and at the appropriate frequencies.

Test Procedures Used

KDB 971168 D01 v03r01 – Section 5.2.1

ANSI/TIA-603-E-2016 – Section 2.2.17

Test Settings

1. Radiated power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation. For signals with burst transmission, the signal analyzer's "time domain power" measurement capability is used
2. RBW = 1 – 5% of the expected OBW, not to exceed 1MHz
3. VBW ≥ 3 x RBW
4. Span = 1.5 times the OBW
5. No. of sweep points ≥ 2 x span / RBW
6. Detector = RMS
7. Trigger is set to "free run" for signals with continuous operation with the sweep times set to "auto". Trigger is set to enable triggering only on full power bursts with the sweep time set less than or equal to the transmission burst duration
8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation. For signals with burst transmission, the "gating" function was enabled to ensure that measurements are performed during times in which the transmitter is operating at its maximum power
9. Trace mode = trace averaging (RMS) over 100 sweeps
10. The trace was allowed to stabilize

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

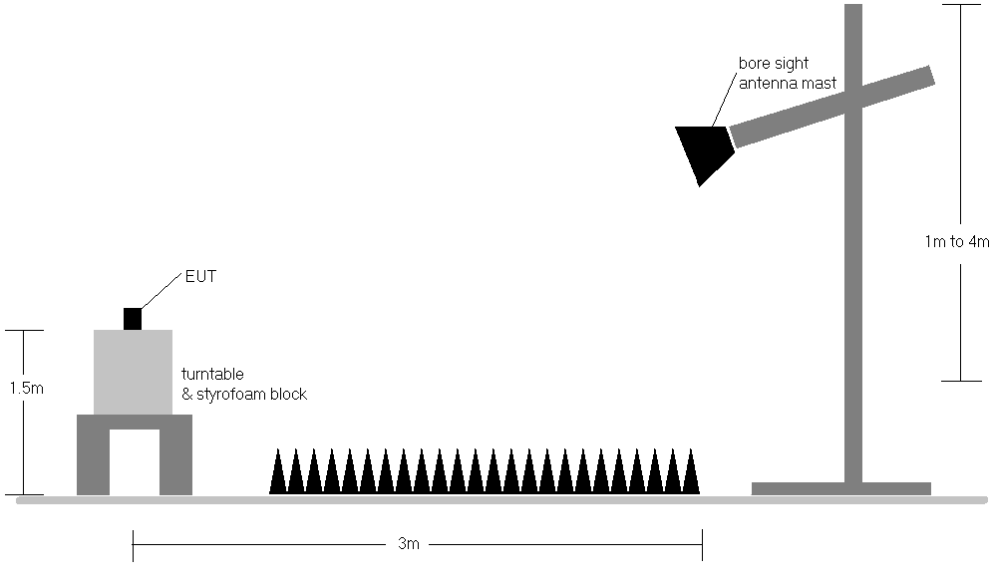


Figure 7-5. Radiated Test Setup >1GHz

Test Notes

1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.

2) This unit was tested with its standard battery.

3) For NR operation, all subcarrier spacings (SCS) and transmission schemes (e.g. CP-OFDM and DFT-s-OFDM) were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
100 MHz	π/2 BPSK	3750.00	H	116	127	5.98	1 / 68	11.81	17.79	0.060	33.01	-15.22
	π/2 BPSK	3840.00	H	112	137	6.02	1 / 68	10.92	16.94	0.049	33.01	-16.07
	π/2 BPSK	3930.00	H	104	128	5.99	1 / 68	10.04	16.03	0.040	33.01	-16.98
	QPSK	3750.00	H	116	127	5.98	1 / 68	11.92	**17.90**	0.062	33.01	-15.11
	QPSK	3840.00	H	112	137	6.02	1 / 68	10.37	16.39	0.044	33.01	-16.62
	QPSK	3930.00	H	104	128	5.99	1 / 68	10.16	16.15	0.041	33.01	-16.86
	16-QAM	3750.00	H	116	127	5.98	1 / 68	9.41	15.39	0.035	33.01	-17.62
90 MHz	π/2 BPSK	3745.02	H	116	127	5.99	1 / 122	11.88	17.87	0.061	33.01	-15.14
	π/2 BPSK	3840.00	H	112	137	6.02	1 / 122	10.69	16.71	0.047	33.01	-16.30
	π/2 BPSK	3934.98	H	104	128	6.02	1 / 122	10.06	16.07	0.040	33.01	-16.94
	QPSK	3745.02	H	116	127	5.99	1 / 122	11.95	**17.94**	0.062	33.01	-15.07
	QPSK	3840.00	H	112	137	6.02	1 / 122	11.16	17.18	0.052	33.01	-15.83
	QPSK	3934.98	H	104	128	6.02	1 / 122	10.21	16.23	0.042	33.01	-16.78
	16-QAM	3745.02	H	116	127	5.99	1 / 122	9.30	15.29	0.034	33.01	-17.72
80 MHz	π/2 BPSK	3740.01	H	116	127	5.99	1 / 108	12.07	**18.07**	0.064	33.01	-14.94
	π/2 BPSK	3840.00	H	112	137	6.02	1 / 108	10.73	16.75	0.047	33.01	-16.26
	π/2 BPSK	3939.99	H	104	128	6.04	1 / 108	10.09	16.14	0.041	33.01	-16.87
	QPSK	3740.01	H	116	127	5.99	1 / 108	11.88	17.87	0.061	33.01	-15.14
	QPSK	3840.00	H	112	137	6.02	1 / 108	11.17	17.19	0.052	33.01	-15.83
	QPSK	3939.99	H	104	128	6.04	1 / 108	10.26	16.31	0.043	33.01	-16.71
	16-QAM	3740.01	H	116	127	5.99	1 / 108	9.24	15.23	0.033	33.01	-17.78
70 MHz	π/2 BPSK	3735.00	H	116	127	6.00	1 / 95	11.94	**17.94**	0.062	33.01	-15.07
	π/2 BPSK	3840.00	H	112	137	6.02	1 / 95	10.75	16.77	0.048	33.01	-16.24
	π/2 BPSK	3945.00	H	104	128	6.07	1 / 95	10.00	16.08	0.041	33.01	-16.93
	QPSK	3735.00	H	116	127	6.00	1 / 95	10.55	16.55	0.045	33.01	-16.46
	QPSK	3840.00	H	112	137	6.02	1 / 95	9.52	15.54	0.036	33.01	-17.47
	QPSK	3945.00	H	104	128	6.07	1 / 95	8.44	14.52	0.028	33.01	-18.49
	16-QAM	3735.00	H	116	127	6.00	1 / 95	8.35	14.35	0.027	33.01	-18.66
60 MHz	π/2 BPSK	3730.02	H	116	127	6.00	1 / 81	11.85	17.85	0.061	33.01	-15.16
	π/2 BPSK	3840.00	H	112	137	6.02	1 / 81	10.80	16.82	0.048	33.01	-16.19
	π/2 BPSK	3949.98	H	104	128	6.10	1 / 81	10.06	16.16	0.041	33.01	-16.85
	QPSK	3730.02	H	116	127	6.00	1 / 81	12.02	**18.03**	0.063	33.01	-14.98
	QPSK	3840.00	H	112	137	6.02	1 / 81	11.19	17.21	0.053	33.01	-15.80
	QPSK	3949.98	H	104	128	6.10	1 / 81	10.17	16.27	0.042	33.01	-16.74
	16-QAM	3730.02	H	116	127	6.00	1 / 81	9.10	15.11	0.032	33.01	-17.90
50 MHz	π/2 BPSK	3725.01	H	116	127	6.01	1 / 99	12.28	18.29	0.067	33.01	-14.72
	π/2 BPSK	3840.00	H	112	137	6.02	1 / 99	11.07	17.09	0.051	33.01	-15.92
	π/2 BPSK	3954.99	H	104	128	6.13	1 / 99	10.40	16.52	0.045	33.01	-16.49
	QPSK	3725.01	H	116	127	6.01	1 / 99	12.34	**18.35**	0.068	33.01	-14.66
	QPSK	3840.00	H	112	137	6.02	1 / 99	11.55	17.57	0.057	33.01	-15.45
	QPSK	3954.99	H	104	128	6.13	1 / 99	10.55	16.68	0.047	33.01	-16.33
	16-QAM	3725.01	H	116	127	6.01	1 / 99	9.22	15.23	0.033	33.01	-17.78
40 MHz	π/2 BPSK	3720.00	H	116	127	6.01	1 / 79	12.32	18.34	0.068	33.01	-14.67
	π/2 BPSK	3840.00	H	112	137	6.02	1 / 79	11.23	17.25	0.053	33.01	-15.76
	π/2 BPSK	3960.00	H	104	128	6.15	1 / 26	10.48	16.63	0.046	33.01	-16.38
	QPSK	3720.00	H	116	127	6.01	1 / 79	12.38	**18.39**	0.069	33.01	-14.62
	QPSK	3840.00	H	112	137	6.02	1 / 79	11.62	17.64	0.058	33.01	-15.37
	QPSK	3960.00	H	104	128	6.15	1 / 79	10.77	16.92	0.049	33.01	-16.09
	16-QAM	3720.00	H	116	127	6.01	1 / 79	9.49	15.51	0.036	33.01	-17.50
30 MHz	π/2 BPSK	3715.02	H	116	127	6.02	1 / 58	12.35	18.37	0.069	33.01	-14.64
	π/2 BPSK	3840.00	H	112	137	6.02	1 / 58	11.22	17.24	0.053	33.01	-15.77
	π/2 BPSK	3964.98	H	104	128	6.18	1 / 58	10.43	16.61	0.046	33.01	-16.40
	QPSK	3715.02	H	116	127	6.02	1 / 58	12.43	**18.45**	0.070	33.01	-14.56
	QPSK	3840.00	H	112	137	6.02	1 / 58	11.70	17.72	0.059	33.01	-15.29
	QPSK	3964.98	H	104	128	6.18	1 / 58	10.60	16.77	0.048	33.01	-16.24
	16-QAM	3715.02	H	116	127	6.02	1 / 58	9.51	15.53	0.036	33.01	-17.48
20 MHz	π/2 BPSK	3710.01	H	116	127	6.03	1 / 13	12.43	18.45	0.070	33.01	-14.56
	π/2 BPSK	3840.00	H	112	137	6.02	1 / 13	11.22	17.24	0.053	33.01	-15.77
	π/2 BPSK	3969.99	H	104	128	6.20	1 / 13	10.36	16.56	0.045	33.01	-16.45
	QPSK	3710.01	H	116	127	6.03	1 / 13	12.61	**18.64**	0.073	33.01	-14.37
	QPSK	3840.00	H	112	137	6.02	1 / 13	11.69	17.71	0.059	33.01	-15.30
	QPSK	3969.99	H	104	128	6.20	1 / 13	10.47	16.67	0.046	33.01	-16.34
	16-QAM	3710.01	H	116	127	6.03	1 / 13	9.56	15.58	0.036	33.01	-17.43
100 MHz	QPSK (CP-OFDM)	3750.0	H	116	207	5.98	1 / 136	9.83	15.81	0.038	33.01	-17.20
	QPSK (Opposite Pol.)	3750.0	V	237	333	5.98	1 / 136	8.29	14.27	0.027	33.01	-18.74

Table 7-2. EIRP Data (NR Band n77 – MAIN Antenna)

7.7 Radiated Spurious Emissions Measurements

Test Overview

Radiated spurious emissions measurements are performed using the field strength conversion method described in KDB 971168 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using horizontally and vertically polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as RMS measurements while the EUT is operating at maximum power, and at the appropriate frequencies.

Test Procedures Used

KDB 971168 D01 v03r01 – Section 5.8

Test Settings

1. RBW = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
2. VBW ≥ 3 x RBW
3. Span = 1.5 times the OBW
4. No. of sweep points ≥ 2 x span / RBW
5. Detector = RMS
6. Trace mode = Average (Max Hold for pulsed emissions)
7. The trace was allowed to stabilize

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

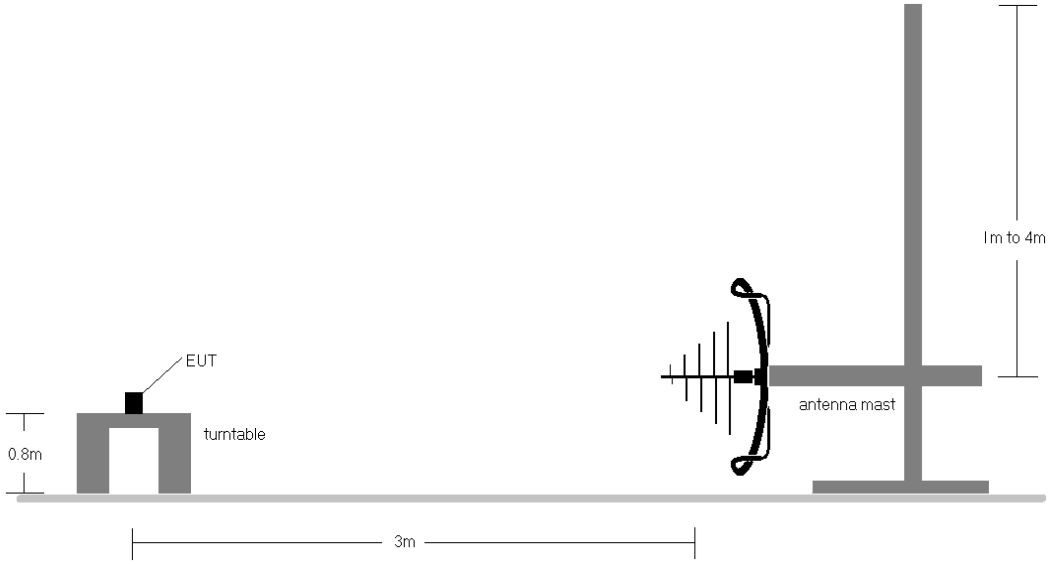


Figure 7-6. Test Instrument & Measurement Setup < 1GHz

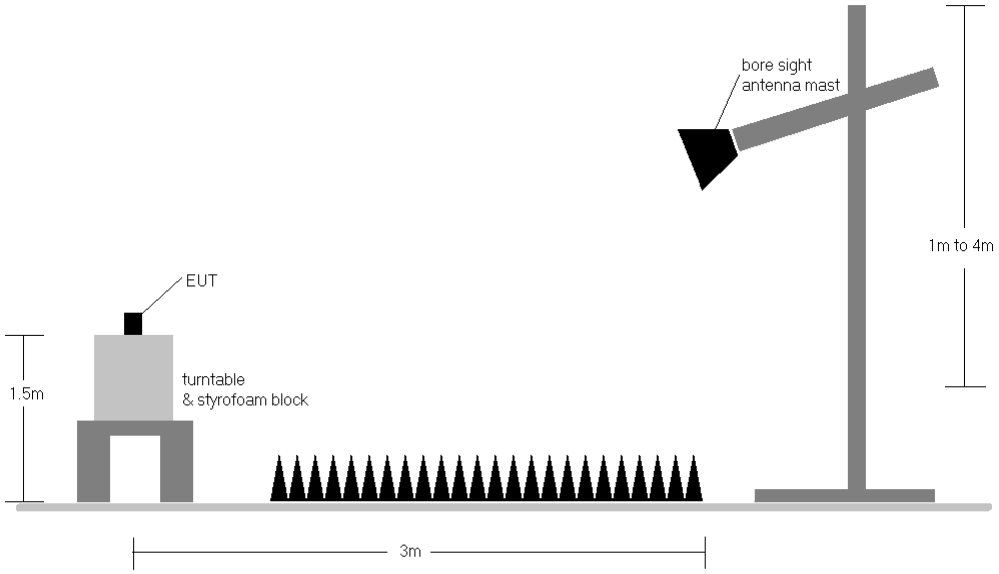


Figure 7-7. Test Instrument & Measurement Setup >1 GHz

Test Notes

1) Field strengths are calculated using the Measurement quantity conversions in KDB 971168 Section 5.8.4.
   a) E(dBµV/m) = Measured amplitude level (dBm) + 107 + Cable Loss (dB) + Antenna Factor (dB/m)
   b) EIRP (dBm) = E(dBµV/m) + 20logD – 104.8; where D is the measurement distance in meters.

2) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.

3) This unit was tested with its standard battery.

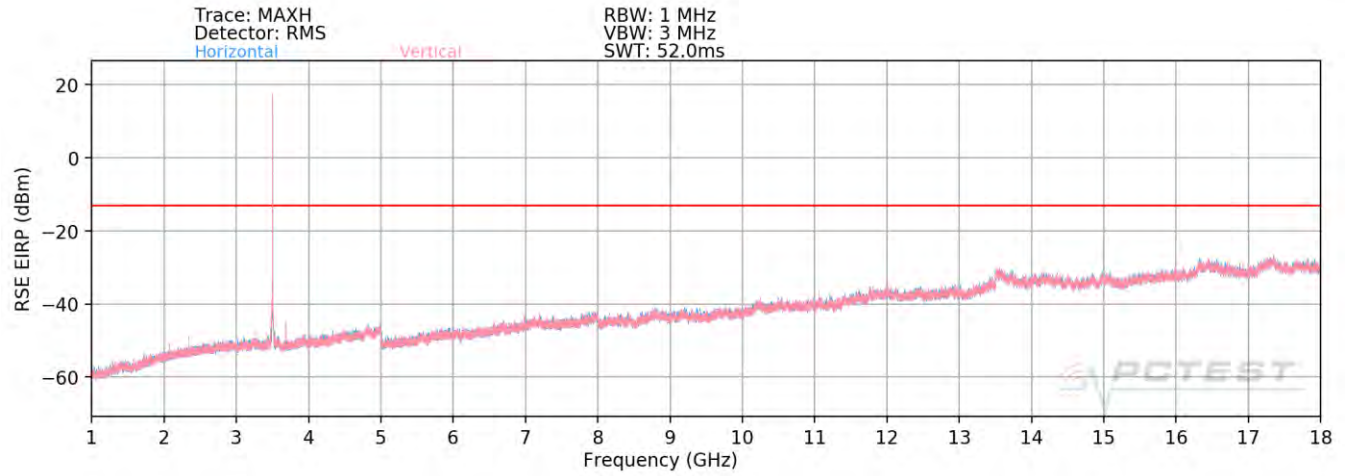
4) The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.

5) Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.

6) The "-" shown in the following RSE tables are used to denote a noise floor measurement.

7) For NR operation, all subcarrier spacings (SCS) and transmission schemes (e.g. CP-OFDM and DFT-s-OFDM) were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

NR Band n77 – MAIN Antenna



Plot 7-81. Radiated Spurious Plot (NR Band n77 – MAIN Antenna)

Bandwidth (MHz):	100
Frequency (MHz):	3750.00
RB / Offset:	1 / 135
Mode:	Stand Alone

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
7500.00	V	116	27	-70.98	21.68	57.70	-37.56	-13.00	-24.56
11250.00	V	-	-	-72.29	27.04	61.75	-33.51	-13.00	-20.51
15000.00	V	-	-	-73.01	31.34	65.33	-29.93	-13.00	-16.93

Table 7-3. Radiated Spurious Data (NR Band n77 – Low Channel – MAIN Antenna)

Bandwidth (MHz):	100
Frequency (MHz):	3840.00
RB / Offset:	1 / 135
Mode:	Stand Alone

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
7680.00	V	113	32	-71.22	22.43	58.21	-37.05	-13.00	-24.05
11520.00	V	-	-	-73.38	27.82	61.44	-33.81	-13.00	-20.81
15360.00	V	-	-	-73.11	31.62	65.51	-29.75	-13.00	-16.75

Table 7-4. Radiated Spurious Data (NR Band n77 – Mid Channel – MAIN Antenna)

Bandwidth (MHz):	100
Frequency (MHz):	3930.00
RB / Offset:	1 / 135
Mode:	Stand Alone

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
7860.00	V	-	-	-71.44	22.32	57.88	-37.37	-13.00	-24.37
11790.00	V	-	-	-73.36	28.03	61.67	-33.59	-13.00	-20.59
15720.00	V	-	-	-72.98	32.41	66.43	-28.83	-13.00	-15.83

Table 7-5. Radiated Spurious Data (NR Band n77 – High Channel – MAIN Antenna)

7.8 Frequency Stability / Temperature Variation

Test Overview and Limit

Frequency stability testing is performed in accordance with the guidelines of ANSI/TIA-603-E-2016. The frequency stability of the transmitter is measured by:

a.) **Temperature:** The temperature is varied from -30°C to +50°C in 10°C increments using an environmental chamber.

b.) **Primary Supply Voltage:** The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

Test Procedure Used

ANSI/TIA-603-E-2016

Test Settings

1. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
2. The equipment is turned on in a "standby" condition for fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
3. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

Test Setup

The EUT was connected via an RF cable to a spectrum analyzer with the EUT placed inside an environmental chamber.

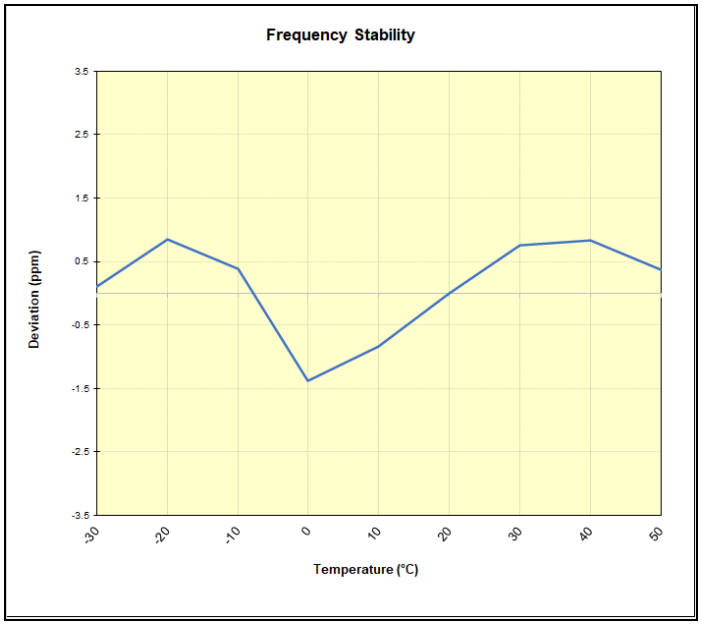
Test Notes

None

NR Band n77	
Operating Frequency (Hz):	3,840,000,000
Ref. Voltage (VDC):	3.86

Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.86	- 30	3,840,014,676	444	0.0000116
		- 20	3,840,017,477	3,245	0.0000845
		- 10	3,840,015,701	1,469	0.0000383
		0	3,840,008,964	-5,268	-0.0001372
		+ 10	3,840,011,018	-3,214	-0.0000837
		+ 20 (Ref)	3,840,014,232	0	0.0000000
		+ 30	3,840,017,128	2,896	0.0000754
		+ 40	3,840,017,446	3,214	0.0000837
		+ 50	3,840,015,637	1,405	0.0000366
Battery Endpoint	3.32	+ 20	3,840,016,676	2,444	0.0000636

Table 7-6. NR Band n77 Frequency Stability Data



Plot 7-82. NR Band n77 Frequency Stability Chart

8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the SONY **Portable Handset FCC ID: PY7-95324M** complies with all the requirements of Part 27 of the FCC rules.