RADIO TEST REPORT

Test Report No. :	**:**	**13760837H-A-R2**
Applicant	**:**	**Panasonic Corporation of North America**
Type of EUT	**:**	**Personal Computer**
Model Number of EUT	**:**	**FZ-G2**
FCC ID	**:**	**ACJ9TGFZG2**
Test regulation	**:**	**FCC Part 30: 2019**
Test Result	**:**	**Complied (Refer to Section 3)**

1. This test report shall not be reproduced in full or partial, without the written approval of UL Japan, Inc.
2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the limits of the above regulation.
4. The test results in this test report are traceable to the national or international standards.
5. This test report must not be used by the customer to claim product certification, approval, or endorsement by the A2LA accreditation body.
6. This test report covers Radio technical requirements.
   It does not cover administrative issues such as Manual or non-Radio test related Requirements. (if applicable)
7. The all test items in this test report are conducted by UL Japan, Inc. Ise EMC Lab.
8 The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan has been accredited.
9. The information provided from the customer for this report is identified in Section 1.

Date of test(s): July 11, 2021 to October 7, 2021

Representative test operator: Y. Yamazaki
Yuichiro Yamazaki
Engineer

Approved by: Takayuki. S
Takayuki Shimada
Leader

CERTIFICATE 5107.02

☐The testing in which "Non-accreditation" is displayed is outside the accreditation scopes in UL Japan, Inc.
☒There is no testing item of "Non-accreditation".

UL Japan, Inc.
Ise EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone: +81 596 24 8999
Facsimile: +81 596 24 8124

Contents

Reference: Abbreviations (Including words undescribed in this report)

A2LA	The American Association for Laboratory Accreditation
AC	Alternating Current
AFH	Adaptive Frequency Hopping
AM	Amplitude Modulation
Amp, AMP	Amplifier
ANSI	American National Standards Institute
Ant, ANT	Antenna
AP	Access Point
ASK	Amplitude Shift Keying
Atten., ATT	Attenuator
AV	Average
BPSK	Binary Phase-Shift Keying
BR	Bluetooth Basic Rate
BT	Bluetooth
BT LE	Bluetooth Low Energy
BW	BandWidth
Cal Int	Calibration Interval
CCK	Complementary Code Keying
Ch., CH	Channel
CISPR	Comite International Special des Perturbations Radioelectriques
CW	Continuous Wave
DBPSK	Differential BPSK
DC	Direct Current
D-factor	Distance factor
DFS	Dynamic Frequency Selection
DQPSK	Differential QPSK
DSSS	Direct Sequence Spread Spectrum
EDR	Enhanced Data Rate
EIRP, e.i.r.p.	Equivalent Isotropically Radiated Power
EMC	ElectroMagnetic Compatibility
EMI	ElectroMagnetic Interference
EN	European Norm
ERP, e.r.p.	Effective Radiated Power
EU	European Union
EUT	Equipment Under Test
Fac.	Factor
FCC	Federal Communications Commission
FHSS	Frequency Hopping Spread Spectrum
FM	Frequency Modulation
Freq.	Frequency
FSK	Frequency Shift Keying
GFSK	Gaussian Frequency-Shift Keying
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
Hori.	Horizontal
ICES	Interference-Causing Equipment Standard
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
IF	Intermediate Frequency
ILAC	International Laboratory Accreditation Conference
ISED	Innovation, Science and Economic Development Canada
ISO	International Organization for Standardization
JAB	Japan Accreditation Board
LAN	Local Area Network
LIMS	Laboratory Information Management System
MCS	Modulation and Coding Scheme
MRA	Mutual Recognition Arrangement
N/A	Not Applicable
NIST	National Institute of Standards and Technology
NS	No signal detect.
NSA	Normalized Site Attenuation
NVLAP	National Voluntary Laboratory Accreditation Program
OBW	Occupied Band Width
OFDM	Orthogonal Frequency Division Multiplexing
P/M	Power meter
PCB	Printed Circuit Board
PER	Packet Error Rate
PHY	Physical Layer
PK	Peak
PN	Pseudo random Noise
PRBS	Pseudo-Random Bit Sequence
PSD	Power Spectral Density
QAM	Quadrature Amplitude Modulation
QP	Quasi-Peak
QPSK	Quadri-Phase Shift Keying
RBW	Resolution Band Width
RDS	Radio Data System
RE	Radio Equipment
RF	Radio Frequency
RMS	Root Mean Square
RSS	Radio Standards Specifications
Rx	Receiving
SA, S/A	Spectrum Analyzer
SG	Signal Generator
SVSWR	Site-Voltage Standing Wave Ratio
TR	Test Receiver
Tx	Transmitting
VBW	Video BandWidth
Vert.	Vertical
WLAN	Wireless LAN
☒	Applied
☐	Not applied

1 Customer information

Company Name	:	Panasonic Corporation of North America
Address	:	Two Riverfront Plaza, 9th Floor Newark, NEW JERSEY, 07102-5940, USA
Telephone Number	:	+1-201-348-7760
Facsimile Number	:	+1-201-348-7760
Contact Person	:	Ben Botros

The information provided from the customer is as follows;
- Applicant, Type of Equipment, Model No. FCC ID on the cover and other relevant pages
- Operating/Test Mode(s) (Mode(s)) on all the relevant pages
- Section 1: Customer information
- Section 2: Equipment under test (EUT) other than the Receipt Date
- Section 4: Operation of EUT during testing

* The laboratory is exempted from liability of any test results affected from the above information in Section 2 and 4.

2 Equipment under test (EUT)

2.1 Identification of EUT

Type	:	Personal Computer
Model Number	:	FZ-G2
Serial number	:	Refer to SECTION 4.2
Rating	:	AC 100 V to 240 V, 50 Hz / 60 Hz
Receipt Date	:	March 30, 2021
Condition	:	Production prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification	:	No Modification by the test lab.

2.2 Product description

Model: FZ-G2 (referred to as the EUT in this report) is a Personal Computer.

Radio Specification

5G NR (FR2)	TDD	120 kHz	n258	Pi/2 BPSK (DFT-s-OFDM), QPSK (CP-OFDM/DFT-s-OFDM)
	TDD	120 kHz	n260	16QAM (CP-OFDM/DFT-s-OFDM),
	TDD	120 kHz	n261	64QAM (CP-OFDM/DFT-s-OFDM)
	-	-	-	
	-	-	-	MIMO Support: No
EN-DC(LTE-FR2 mmW) (NSA mode only)	Supported combination			*B48: not used in Canada(ISED)
	LTE Anchor Bands for NR band n258			LTE Band 2/5/7/12/66
	LTE Anchor Bands for NR band n260			LTE Band 2/5/12/13/14/48*/66
	LTE Anchor Bands for NR band n261			LTE Band 2/5/13/48*/66

Antenna type : Patch Antenna
(Cross-polarized array of 1 by 4 elements)

Antenna gain : See the table below

Band n258a

Antenna	Ant Pol(V/H)	Channel	Beam ID	Paired with	Feed No.	Antenna Gain [dBi]
#0	H	Low	150		4	9.2
		High	150		4	9.2
	V	Low	22		4	8.8
		High	22		4	8.9
	V&H	Low	36	164	4	8.4
		High	36	164	4	8.6
#1	H	Low	155		4	8.7
		High	155		4	8.8
	V	Low	27		4	8.8
		High	40		4	8.8
	V&H	Low	27	155	4	8.0
		High	40	168	4	8.2
#2	H	Low	160		4	8.4
		High	161		4	8.7
	V	Low	33		4	8.7
		High	33		4	8.8
	V&H	Low	32	160	4	7.8
		High	33	161	4	7.9

Band n258b

Antenna	Ant Pol(V/H)	Channel	Beam ID	Paired with	Feed No.	Antenna Gain [dBi]
#0	H	Low	150		4	9.4
		High	150		4	9.4
	V	Low	36		4	9.0
		High	36		4	9.4
	V&H	Low	36	164	4	9.0
		High	36	164	4	9.5
#1	H	Low	157		4	8.5
		High	170		4	8.4
	V	Low	27		4	9.1
		High	27		4	9.4
	V&H	Low	40	168	4	8.2
		High	27	155	4	8.4
#2	H	Low	161		4	9.1
		High	173		4	9.2
	V	Low	33		4	8.9
		High	33		4	9.3
	V&H	Low	33	161	4	8.3
		High	33	161	4	8.7

Band n260

Antenna	Ant Pol(V/H)	Channel	Beam ID	Paired with	Feed No.	Antenna Gain [dBi]
#0	H	Low	151		4	10.8
		Mid	151		4	11.3
		High	165		4	10.6
	V	Low	23		4	10.0
		Mid	23		4	10.8
		High	38		4	10.4
	V&H	Low	23	151	4	10.5
		Mid	37	165	4	10.9
		High	37	165	4	10.5
#1	H	Low	156		4	10.1
		Mid	170		4	10.9
		High	170		4	10.2
	V	Low	28		4	9.5
		Mid	28		4	9.8
		High	41		4	9.4
	V&H	Low	27	155	4	9.1
		Mid	28	156	4	10.3
		High	41	169	4	9.6
#2	H	Low	161		4	10.1
		Mid	161		4	10.5
		High	174		4	10.2
	V	Low	33		4	9.7
		Mid	33		4	9.7
		High	32		4	9.6
	V&H	Low	32	160	4	9.3
		Mid	33	161	4	10.5
		High	46	174	4	10.2

Band n261

Antenna	Ant Pol(V/H)	Channel	Beam ID	Paired with	Feed No.	Antenna Gain [dBi]
#0	H	Low	152		4	9.5
		Mid	150		4	9.3
		High	166		4	9.2
	V	Low	22		4	8.9
		Mid	22		4	9.2
		High	22		4	9.1
	V&H	Low	22	150	4	9.1
		Mid	22	150	4	9.1
		High	22	150	4	9.1
#1	H	Low	157		4	9.1
		Mid	155		4	9.4
		High	157		4	9.2
	V	Low	27		4	9.4
		Mid	27		4	9.6
		High	27		4	9.4
	V&H	Low	28	156	4	8.5
		Mid	28	156	4	8.9
		High	27	155	4	9.1
#2	H	Low	160		4	9.2
		Mid	160		4	9.2
		High	160		4	9.3
	V	Low	46		4	9.0
		Mid	34		4	8.8
		High	47		4	9.3
	V&H	Low	32	160	4	9.0
		Mid	32	160	4	9.1
		High	45	173	4	9.1

Radio Module (Tested inside of Panasonic Tablet PC FZ-G2) Model : WW21A (FCC ID ACJ9TGWW21A / ISED certification number 216H-CFWW21A)				
Wireless technologies	Dup.	Band		Mode
WCDMA	FDD		2	UMTS Rel. 99 (Data) HSDPA (Rel. 5)
	FDD		4	HSUPA (Rel. 6), HSPA+ (Rel. 7), DC-HSDPA (Rel. 8)
	FDD		5	
LTE	FDD		2	QPSK, 16QAM, 64AQM, 256QAM
	FDD		4	
	FDD		5	Downlink MIMO Support: Yes(2x2, 4x4)
*B42: not used in US (FCC)	FDD		7	Supported band : B2, B4, B7, B25, B38, B41, B42, B48, B66
	FDD		12	
*B48: not used in	FDD		13	Uplink MIMO Support: No
Canada(ISED)	FDD		14	Uplink transmission is limited to a single output stream.
	FDD		17	
	FDD		25	
	FDD		26	
	FDD(RX only)		29	
	TDD		38	
	TDD		41	
	TDD		42	
	TDD(Rx only)		46	
	TDD		48	
	FDD		66	
	FDD		71	
LTE CA	Downlink			Uplink *B42: not used in US (FCC) / B48: not used in Canada(ISED)
	Maximum 7 carriers			Maximum 2 carriers Supported combination: <Inrta-band contiguous> 7C, 41C, 42C, 48C <Inter-band> Not supported
5G NR (FR1)	FDD	15 kHz	n2	Pi/2 BPSK (DFT-s-OFDM),
	FDD	15 kHz	n5	QPSK (CP-OFDM/DFT-s-OFDM),
*n77, n78: not used in US	TDD	15 kHz	n41	16QAM (CP-OFDM/DFT-s-OFDM),
(FCC)	FDD	15 kHz	n66	64QAM (CP-OFDM/DFT-s-OFDM),
	FDD	15 kHz	n71	256QAM (CP-OFDM/DFT-s-OFDM)
	TDD	30 kHz	n77	Downlink MIMO Support: Yes(2x2, 4x4)
	TDD	30 kHz	n78	Supported band : n2, n41, n66, n77, n78
	-	-	-	Uplink MIMO Support: No
	-	-	-	Uplink transmission is limited to a single output stream.
EN-DC(LTE-FR1 Sub6)	Supported combination			*n77, n78: not used in US (FCC)
(NSA mode only)	LTE Anchor Bands for NR band n2			LTE Band 5/12/13
	LTE Anchor Bands for NR band n5			LTE Band 2/7/66
	LTE Anchor Bands for NR band n41			LTE Band 2/25/26/66
	LTE Anchor Bands for NR band n66			LTE Band 5/12/13/14/71
	LTE Anchor Bands for NR band n71			LTE Band 2/7/66
	LTE Anchor Bands for NR band n77*			LTE Band 41
	LTE Anchor Bands for NR band n78*			LTE Band 2/5/7/12/38/66

Wireless module(Tested inside of Panasonic Tablet PC FZ-G2) Model : WL20B(FCC ID ACJ9TGWL20B / ISED certification Number 216H-CFWL20B)				
Wireless technologies	Dup.	Band		Mode
WLAN	TDD	2.4GHz	2412-2472	802.11b 802.11g 802.11n(20,40) 802.11ax(20,40)
	TDD	5GHz	5180-5240 5260-5320 5500-5720 5745-5825	802.11a 802.11n(20,40) 802.11ac(20,40.80.160) 802.11ax(20,40.80.160)
Bluetooth	TDD	2.4GHz	2402-2480	BR/EDR/LE

*This report is for mmW range

3 Test standard information

3.1 Test Specification

	Part	Title
☒	47 CFR Part 2	FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS
☒	47 CFR Part 30	UPPER MICROWAVE FLEXIBLE USE SERVICE

Procedures and KDB

	Name of documents	Title
☒	ANSI C63.26-2015	American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services
☒	KDB 842590 D01 v01r02	Upper Microwave Flexible Use Service
☒	KDB 971168 D01 v03r01	Power Meas License Digital Systems

UL Japan, Inc. 's Work Procedures Procedure

	Name of documents	Title
☒	13-EM-W0420	UL Japan, Inc.'s EMI work procedures

3.2 Summary of results

FCC Part Section	Test Description	Test Limit	Test condition	Test result [1]
2.1049	Occupied Bandwidth (OBW)	N/A	Radiated	Reference a)
2.1046 30.202	Equivalent Isotropic Radiated Power (EIRP)	+43 dBm	Radiated	Complied b)
2.1051 30.203	Out Of Band Emissions at Band Edge (OOB)	-13 dBm/MHz for All out-of-band emissions. -5 dBm/MHz from the band edge up to 10% of the channel BW	Radiated	Complied c)
2.1051 30.203	Spurious Emissions	- 13 dBm / MHz for all out-of-band emissions	Radiated	Complied d)
2.1055	Frequency Stability	N/A	Radiated	Reference e)

a) Refer to APPENDIX 1 (data of OBW)
b) Refer to APPENDIX 1 (data of EIRP)
c) Refer to APPENDIX 1 (data of OOB)
d) Refer to APPENDIX 1 (data of Spurious Emissions)
e) Refer to APPENDIX 1 (data of Frequency Stability)

[1] Complied: The data of this test item has enough margin, more than the measurement uncertainty.
Complied# The data of this test item meets the limits unless the measurement uncertainty is taken into consideration.

3.3 Additions or deviations to standard

Other than above, no addition, exclusion nor deviation has been made from the standard.

3.4 Uncertainty

There is no applicable rule of uncertainty in this applied standard. Therefore, the results are derived depending on whether or not laboratory uncertainty is applied.

The following uncertainties have been calculated to provide a confidence level of 95 % using a coverage factor k=2.

Radiated emission		**Uncertainty (+/-)**	**Measurement distance**
9 kHz to 30 MHz		3.3 dB	3 m
		3.2 dB	10 m
30 MHz to 200 MHz	(Horizontal)	4.8 dB	3 m
	(Vertical)	5.0 dB	
200 MHz to 1000 MHz	(Horizontal)	5.2 dB	
	(Vertical)	6.3 dB	
30 MHz to 200 MHz	(Horizontal)	4.8 dB	10 m
	(Vertical)	4.8 dB	
200 MHz to 1000 MHz	(Horizontal)	5.0 dB	
	(Vertical)	5.0 dB	
1 GHz to 6 GHz		4.9 dB	3 m
6 GHz to 18 GHz		5.2 dB	
10 GHz to 26.5 GHz		5.5 dB	1 m
26.5 GHz to 40 GHz		5.5 dB	
1 GHz to 18 GHz		5.2 dB	10 m
40 GHz - 50 GHz		4.1 dB	>= 0.5 m
50 GHz - 75 GHz		5.1 dB	>= 0.5 m
75 GHz - 110 GHz		5.4 dB	>= 0.5 m
110 GHz - 170 GHz (Extension Module)		4.8 dB	>= 3.8 cm
170 GHz - 260 GHz (Extension Module)		7.8 dB	>= 2.5 cm

Frequecy stability	**Uncertainty (+/-)**
Frequecy stability	2.08.E-07

3.5 Test Location

UL Japan, Inc. Ise EMC Lab.
*A2LA Certificate Number: 5107.02 / FCC Test Firm Registration Number: 884919
ISED Lab Company Number: 2973C / CAB identifier: JP0002
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone: +81 596 24 8999, Facsimile: +81 596 24 8124

Test site	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms	Maximum measurement distance
No.1 semi-anechoic chamber	19.2 x 11.2 x 7.7	7.0 x 6.0	No.1 Power source room	10 m
No.2 semi-anechoic chamber	7.5 x 5.8 x 5.2	4.0 x 4.0	-	3 m
No.3 semi-anechoic chamber	12.0 x 8.5 x 5.9	6.8 x 5.75	No.3 Preparation room	3 m
No.3 shielded room	4.0 x 6.0 x 2.7	N/A	-	-
No.4 semi-anechoic chamber	12.0 x 8.5 x 5.9	6.8 x 5.75	No.4 Preparation room	3 m
No.4 shielded room	4.0 x 6.0 x 2.7	N/A	-	-
No.5 semi-anechoic chamber	6.0 x 6.0 x 3.9	6.0 x 6.0	-	-
No.5 measurement room	6.4 x 6.4 x 3.0	6.4 x 6.4	-	-
No.6 shielded room	4.0 x 4.5 x 2.7	4.0 x 4.5	-	-
No.6 measurement room	4.75 x 5.4 x 3.0	4.75 x 4.15	-	-
No.7 shielded room	4.7 x 7.5 x 2.7	4.7 x 7.5	-	-
No.8 measurement room	3.1 x 5.0 x 2.7	3.1 x 5.0	-	-
No.9 measurement room	8.8 x 4.6 x 2.8	2.4 x 2.4	-	-
No.10 shielded room	3.8 x 2.8 x 2.8	3.8 x 2.8	-	-
No.11 measurement room	4.0 x 3.4 x 2.5	N/A	-	-
No.12 measurement room	2.6 x 3.4 x 2.5	N/A	-	-

* Size of vertical conducting plane (for Conducted Emission test) : 2.0 x 2.0 m for No.1, No.2, No.3, and No.4 semi-anechoic chambers and No.3 and No.4 shielded rooms.

3.6 Test data, Test instruments, and Test set up

Refer to APPENDIX.

4 Operation of EUT during testing

4.1 Mode and channel plan

All testing was performed using FTM (Factory Test Mode) software at continuous Tx operation. When implemented out in the field, the EUT will operate with a maximum uplink configuration (i.e., a maximum uplink duty cycle of 100%).

The beam IDs were selected based on EIRP simulation resulting the highest value provided from customer. (Refer Table 4-2 to 4-5)

All modulations, RB size, Cyclic Prefix OFDM (CP-OFDM), Discrete Fourier Transform Spread OFDM (DFT-s-OFDM) and Subcarrier Spacing (SCS) were investigated and the worst-case configuration result are reported.

The EUT cannot activate with the some 5G module antennas, while the test only one antenna was active.

Table 4-1 channel plan

Band	CC	SCK [kHz]	CBW [MHz]	Channel	Ch No.	Frequency [MHz]
n258a	1	120	50	Low	2017083	24275.04
				High	2019582	24424.98
			100	Low	2017499	24300.00
				High	2019165	24399.96
n258b	1	120	50	Low	2025417	24775.08
				High	2032915	25224.96
			100	Low	2025833	24800.04
				High	2032499	25200.00
n260	1	120	50	Low	2229583	37025.04
				Mid	2254165	38499.96
				High	2278749	39975.00
			100	Low	2229999	37050.00
				Mid	2254165	38499.96
				High	2278331	39949.92
n261	1	120	50	Low	2071249	27525.00
				Mid	2077915	27924.96
				High	2084581	28324.92
			100	Low	2071667	27550.08
				Mid	2077915	27924.96
				High	2084165	28299.96

“CC” refers to “Component Carriers”.

Table 4-2 worst beam ID (band n258a)

Antenna	Beam Pol.	Channel	Beam ID	Paired with
#0	H	Low	150	-
		High	150	-
	V	Low	22	-
		High	22	-
	H + V	Low	36	164
		High	36	164
#1	H	Low	155	-
		High	155	-
	V	Low	27	-
		High	40	-
	H + V	Low	27	155
		High	40	168
#2	H	Low	160	-
		High	161	-
	V	Low	33	-
		High	33	-
	H + V	Low	32	160
		High	33	161

Table 4-3 worst beam ID (band n258b)

Antenna	Beam Pol.	Channel	Beam ID	Paired with
#0	H	Low	150	-
		High	150	-
	V	Low	36	-
		High	36	-
	H + V	Low	36	164
		High	36	164
#1	H	Low	157	-
		High	170	-
	V	Low	27	-
		High	27	-
	H + V	Low	40	168
		High	27	155
#2	H	Low	161	-
		High	173	-
	V	Low	33	-
		High	33	-
	H + V	Low	45	173
		High	33	161

Table 4-4 worst beam ID (band n260)

Antenna	Beam Pol.	Channel	Beam ID	Paired with
#0	H	Low	151	-
		Mid	151	-
		High	150	-
	V	Low	23	-
		Mid	23	-
		High	38	-
	H + V	Low	23	151
		Mid	37	165
		High	37	165
#1	H	Low	156	-
		Mid	170	-
		High	170	-
	V	Low	28	-
		Mid	28	-
		High	41	-
	H + V	Low	27	155
		Mid	28	156
		High	41	169
#2	H	Low	161	-
		Mid	161	-
		High	174	-
	V	Low	33	-
		Mid	33	-
		High	32	-
	H + V	Low	32	160
		Mid	33	161
		High	46	174

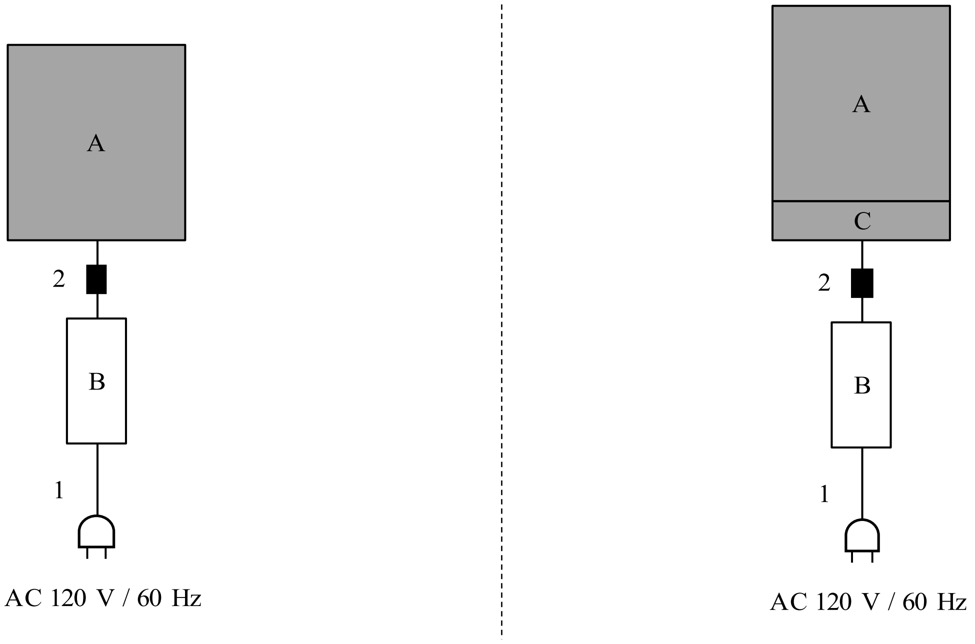
Table 4-5 worst beam ID (band n261)

Antenna	Beam Pol.	Channel	Beam ID	Paired with
#0	H	Low	152	-
		Mid	150	-
		High	166	-
	V	Low	37	-
		Mid	22	-
		High	22	-
	H + V	Low	22	150
		Mid	22	150
		High	22	150
#1	H	Low	157	-
		Mid	155	-
		High	155	-
	V	Low	27	-
		Mid	27	-
		High	27	-
	H + V	Low	28	156
		Mid	28	156
		High	27	155
#2	H	Low	160	-
		Mid	160	-
		High	160	-
	V	Low	46	-
		Mid	34	-
		High	47	-
	H + V	Low	32	160
		Mid	32	160
		High	45	173

4.2 Configuration and peripherals

Other than Frequency stability test

[without Keyboard Base] [with Keyboard Base]



* Cabling and setup(s) were taken into consideration and test data was taken under worse case conditions.

Description of EUT and Support equipment

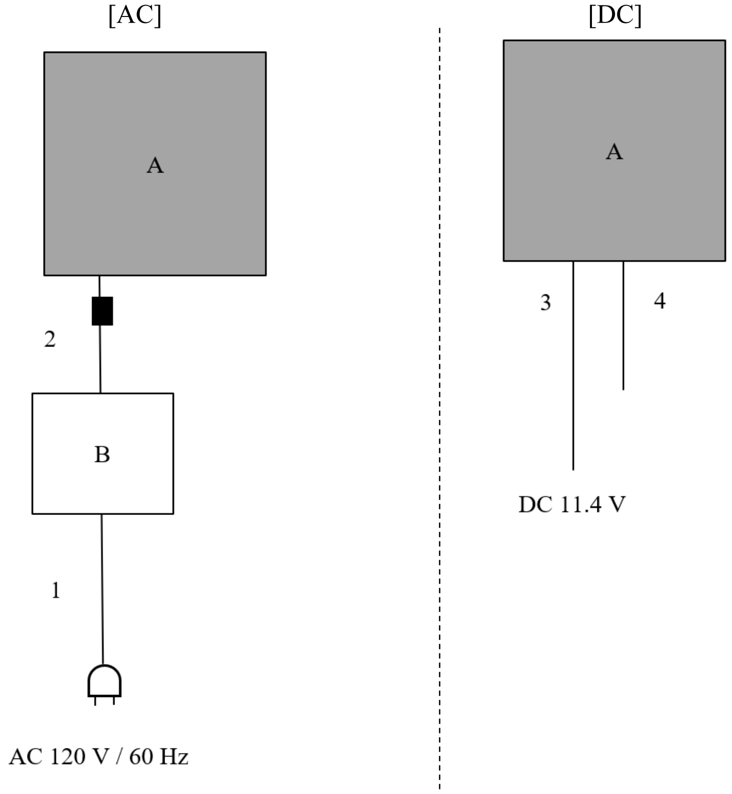
No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Personal Computer	FZ-G2	0LTSA00729 *1) 1DTSA00032 *2)	Panasonic Corporation	EUT
B	AC Adaptor	CF-AA5713A M3	5713AM317202962D	Panasonic Corporation	-
C	Keyboard Base	FZ-VEKG21	OJTSA00211	Panasonic Corporation	EUT

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	AC Cable	2.0	Unshielded	Unshielded	-
2	DC Cable	1.5	Unshielded	Unshielded	-

*1) Used for tests other than *2)
*2) Used for OBW, EIRP and OOB (Other than "Hori. + Vert." of #0) tests

Frequency stability test



* Cabling and setup(s) were taken into consideration and test data was taken under worse case conditions.

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Personal Computer	FZ-G2	1DTSA00032	Panasonic Corporation	EUT
B	AC Adaptor	CF-AA5713A M3	5713AM317202962D	Panasonic Corporation	-

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	AC Cable	2.00	Unshielded	Unshielded	-
2	DC Cable	1.50	Unshielded	Unshielded	-
3	DC Cable	1.50	Unshielded	Unshielded	-
4	Signal Cable	0.16	Unshielded	Unshielded	-

4.3 Software and version information

Power of the EUT was set by the software as follows;
Power settings: 120 (When this value was set, the transmitting power was controlled to the same value as production maximum power setting values)
Software: Qualcomm Radio Control Toolkit
Version: Ver.4.0

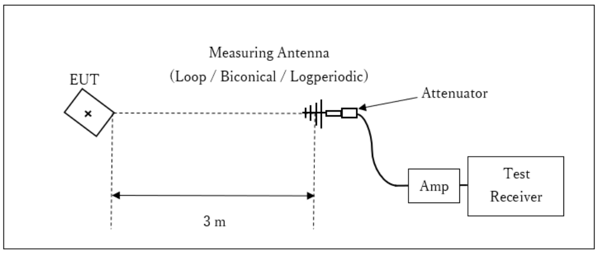
This setting of software is the worst case.
Any conditions under the normal use do not exceed the condition of setting.
In addition, end users cannot change the settings of the output power of the product.

5 Radiated emission

5.1 Far-field distance and measurement distance

Figure 1 General test set up

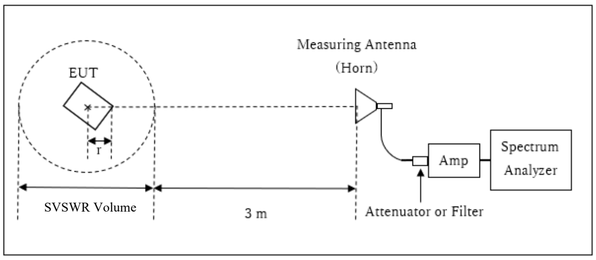
Below 1 GHz



× : Center of turn table

Test Distance: 3 m

1 GHz - 18 GHz



r : Radius of an outer periphery of EUT

× : Center of turn table

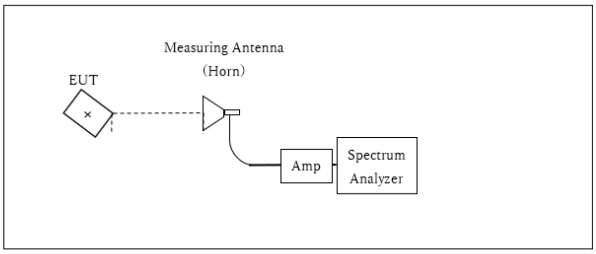
Test Distance: (3 + SVSWR Volume /2) - r = 4.0 m

SVSWR Volume : 2.0 m
r = 0m

(SVSWR Volume has been calibrated based on CISPR 16-1-4.)

* The test was performed with r = 0.0 m since EUT is small and it was the rather conservative condition.

18 GHz - 200 GHz



× : Center of turn table

Test Distance: Refer Appendix B.3

- The carrier level and noise levels were confirmed at each position of X, Y and Z axes of EUT to see the position of maximum noise, and the test was made at the position that has the maximum noise.

5.2 OBW

Limit: For reporting purposes only

Test procedure:
KDB 842590 D01 Upper Microwave Flexible Use Service v01 Section 4.3
ANSI C63.26-2015 Clause 5.4.3.

99% bandwidth measurement function of the signal analyzer was used to measure 99% occupied.

- RBW = 1 – 5% of OBW
- VBW ≥ 3 x RBW
- Detector = Peak
- Trace mode = max hold
- Sweep = auto couple
- The trace was allowed to stabilize

All modulations were investigated in single beam/single beam-dual/paired beam to determine worst case configuration.
All modes of operations were investigated and the results were reported in this section.

Test engineer and Test condition: Refer Appendix A.6

5.3 EIRP

Limit: 30.202 (b) - For mobile stations, the average power of the sum of all antenna elements is limited to a maximum EIRP of +43 dBm.

Test procedure:
KDB 842590 D01 Upper Microwave Flexible Use Service v01 Section 4.2
ANSI C63.26-2015 Clause 5.2, Clause 5.5, Clause 6.4, and Annex C.5.2

Radiated power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation.

- RBW = 1 – 5% of the OBW, not to exceed 1 MHz
- VBW ≥ 3 x RBW
- Span = 2x to 3x the OBW
- Number of measurement points in sweep > 2 x span / RBW
- Sweep time = auto-couple
- Detector = RMS
- Trace mode = Average over 100 sweeps

EIRP was calculated using the equations on section 5.2.7 of ANSI C63.26-2015.
Sample calculation of EIRP:
EIRP [dBm] = *E* [dBuV/m] + 20log(*D*) -104.8; where *D* is measurement distance (in the far field region) in m.

Sample calculation of The field strength *E*:
E [dBuV/m] = S/A Channel Power Level [dBm] + Rx Antenna Factor [dB/m] – Rx Amp. Gain [dB] + Cable Loss [dB] +107.

That is, set the spectrum offset including sum of the following correction factor (*CF*).

Sample calculation of *CF*:
CF [dB] = Antenna Factor [dB/m] -Rx Amp. Gain [dB] + Cable Loss [dB] +107 + 20log(D) – 104.8

Example:
CF [dB] = Antenna Factor [dB/m] -Rx Amp. Gain [dB] + Cable Loss [dB] +107 + 20log(D) – 104.8
= 40.32 - 25.32 + 14.13 + 107 + 20log(1) - 104.8
= 31.32 [dB]

EIRP measurements were taken at 1 m test distance.

Radiated power levels are investigated while the receive antenna was rotated through all angles to determine the worst-case polarization/positioning. EUT was set for each mode X axis. (See Appendix C.3)

For antenna every antenna, π /2-BPSK, QPSK, 16QAM and 64QAM modulations were all investigated in H beam, V beam, H+V beam configurations.

For H+V beam configuration, EIRP of H polarization and V polarization were measured respectively, and EIRP of H+V beam configuration was calculated by totaling the EIRP of H polarization and V polarization.

Single RB (1RB) and Full RB Inner allocations were measured.

Test engineer and Test condition: Refer Appendix A.6

Result: Pass

5.4 Band edge emission (OOB)

Limit: 30.203 (a) - The conductive power or the total radiated power of any emission outside a licensee's frequency block shall be −13 dBm/MHz or lower. However, in the bands immediately outside and adjacent to the licensee's frequency block, having a bandwidth equal to 10 percent of the channel bandwidth, the conductive power or the total radiated power of any emission shall be −5 dBm/MHz or lower.

Test procedure:
KDB 842590 D01 Upper Microwave Flexible Use Service v01 Section 4.2
ANSI C63.26-2015 Clause 5.2, Clause 5.5, Clause 6.4, and Annex C.5.2

The band edge emissions are conducted below settings.

- RBW = 1 MHz
- VBW ≥ 3 x RBW
- Number of measurement points in sweep > 2 x span / RBW
- Sweep time = auto-couple
- Detector = RMS
- Trace mode = Average

Band Edge measurements were measured as EIRP for direct comparison to the 30.203 TRP limit to demonstrate compliance.

The appropriate far field test distance, listed on Section 5, was used at test.

EIRP was calculated using the equations on section 5.2.7 of ANSI C63.26-2015.
Sample calculation of EIRP:
EIRP [dBm] = *E* [dBuV/m] + 20log(*D*) -104.8 + 3; where *D* is measurement distance (in the far field region) in m.

Sample calculation of The field strength *E*:
E [dBuV/m] = S/A Reading Level [dBm] + Rx Antenna Factor [dB/m] – Rx Amp. Gain [dB] + Cable Loss [dB] +107 + 3.

That is, set the spectrum offset including sum of the following correction factor (*CF*).

Sample calculation of *CF*:
CF [dB] = Rx Antenna Factor [dB/m] -Rx Amp. Gain [dB] + Cable Loss [dB] +107 + 20log(*D*) – 104.8 + 3

Example:
CF [dB] = Antenna Factor [dB/m] -Rx Amp. Gain [dB] + Cable Loss [dB] +107 + 20log(D) – 104.8 + 3
= 40.32 - 25.32 + 14.13 + 107 + 20log(1) - 104.8 + 3
= 34.32 [dB]

BPSK, QPSK, 16QAM and 64QAM modulations at DFT-s-OFDM were all investigated in H+V beam configurations. The highest band edge emissions were for H+V beam configuration consistent with this also being the configuration with the highest EIRP. The H+V beam configuration was calculated by adding 3 dB to the higher EIRP of H polarization or V polarization.

Single RB (1RB) and Full RB Outer allocations were measured.

Test engineer and Test condition: Refer Appendix A.6

Result: Pass

5.5 Radiated spurious emission (RSE)

Limit: 30.203 - (a) The conductive power or the total radiated power of any emission outside a licensee's frequency block shall be −13 dBm/MHz or lower.

Test procedure:
KDB 842590 D01 Upper Microwave Flexible Use Service v01 Section 4.4.2 and Section 4.4.3
ANSI C63.26-2015 Clause 5.5 and Annex C.5.2

All radiated spurious emissions were measured as EIRP to compare with the §30.203 TRP limits to demonstrate compliance.

RSE was investigated from 9 kHz – 200 GHz on n260, 9 kHz – 100 GHz on n258a, n258b and n261.

EIRP was calculated using the equations on section 5.2.7 of ANSI C63.26-2015.
Sample calculation of EIRP:
EIRP [dBm] = *E* [dBuV/m] + 20log(*D*) -104.8; where *D* is measurement distance (in the far field region) in m.

Sample calculation of The field strength *E*:
E [dBuV/m] = S/A Reading Level [dBm] + Rx Antenna Factor [dB/m] – Rx Amp. Gain [dB] + Loss(Cable + External harmonic Mixer) [dB] + External harmonic Mixer Loss [dB] +107.

That is, correct the S / A Reading Level with the sum of the following correction factor (*CF*).

Sample calculation of *CF*:
CF [dB] = Antenna Factor [dB/m] -Rx Amp. Gain [dB] + Loss(Cable + External harmonic Mixer) +107 + 20log(D) – 104.8

Example:
CF [dB] = Antenna Factor [dB/m] -Rx Amp. Gain [dB] + Loss(Cable + External harmonic Mixer) +107 + 20log(D) – 104.8
= 40.32 - 25.32 + 14.13 + 107 + 20log(1) - 104.8
= 31.32 [dB]

The chart in the data were not corrected by *CF*.
The corrected EIRP at the frequency at which the emissions were detected were listed in the table.

RSEs from 18 – 50 GHz were measured using a spectrum analyzer with an internal preamplifier when applicable. Emissions above 50 GHz were measured using an external harmonic mixer with spectrum analyzer, while an external Low noise amplifier (LNA) was used when applicable. RSEs from 1 – 200 GHz were measured at 1.5 meters height.

All RSEs were measured for the configuration with the highest EIRP (H +V configuration with a single RB) as representing the worst case. Preliminary radiated emissions tests on the low, mid and high channels indicated that the worst case radiated spurious emissions were on the channel with the highest power and so only the test data for that channel is included in this report. (Refer Table 5-1)

Table 5-1 RSEs test mode (Worst case)

Band	Antenna	Beam Pol.	Bandwidth [MHz]	Transmmison scheme	Modultation	Channel	RB (Size/Offset)
n258a	#0	H+V	50	DFT-s-OFDM	π/2-BPSK	Low	1/11
	#1	H+V	50	DFT-s-OFDM	π/2-BPSK	Low	1/11
	#2	H+V	100	DFT-s-OFDM	QPSK	High	1/43
n258b	#0	H+V	50	DFT-s-OFDM	π/2-BPSK	Low	1/11
	#1	H+V	100	DFT-s-OFDM	π/2-BPSK	High	1/43
	#2	H+V	100	DFT-s-OFDM	QPSK	High	1/43
n260	#0	H+V	50	DFT-s-OFDM	QPSK	Low	1/11
	#1	H+V	50	DFT-s-OFDM	QPSK	Low	1/11
	#2	H+V	100	DFT-s-OFDM	π/2-BPSK	Low	1/22
n261	#0	H+V	100	DFT-s-OFDM	π/2-BPSK	Low	1/22
	#1	H+V	50	DFT-s-OFDM	QPSK	Low	1/11
	#2	H+V	100	DFT-s-OFDM	π/2-BPSK	Low	1/22

As the single RB with 1CC mode has the highest power and is the same for all channel bandwidths, therefore the single RB with 1CC for the narrowest channel bandwidth was used as the worst case for purposes of RSE measurements.

The emissions in the table show the maximum values tested for the axes at X, Y and Z.

Where the measured EIRP value is within 2 dB of the limit, a TRP measurement is made, otherwise the EIRP value is compared with the §30.203 TRP limits to demonstrate compliance.

Test engineer and Test condition: Refer Appendix A.6

Result: Pass

6 Frequency stability

Limit: For reporting purposes only

Test procedure:
KDB 842590 D01 Upper Microwave Flexible Use Service v01 Section 4.5
ANSI C63.26-2015 Clause 5.6

Test procedures for temperature variation:

1. Position the EUT in temperature/humidity chamber with power off.
2. Set chamber temperature to -30 °C and stabilize the EUT for at least 30 minutes.
3. Record maximum change in frequency within one minute after powering the EUT.
4. Increase chamber temperature at 10 °C intervals from -30 °C to 50 °C. Record maximum change in frequency at each temperature.
5. A period of at least 30 minutes is provided to allow stabilization of the equipment at each temperature level.

Tested temp. = -30 °C to +50 °C

Test procedures for voltage variation:

1. Position the EUT in temperature/humidity chamber with power off.
2. Set chamber temperature to 20 °C.
3. Record maximum frequency change within one minute after powering the EUT.
4. The test voltage is changed from 85 % to 115 % of the nominal value of AC and DC as follows. For DC, test with endpoint voltage.

Tested voltage range = (85 % to 115 %)
DC

100 %:	11.7 V
85 %:	9.69 V
115 %:	13.11 V
end point:	7.1 V

AC

100 %:	120 V / 60 Hz
85 %:	138 V / 60 Hz
115 %:	102 V / 60 Hz

The measurements were Performed with the CW signal on antenna #0, because the difference in output frequency due to the antenna was confirmed in advance to confirm that there was no difference.

Test engineer and Test condition: Refer Appendix A.6

Appendix A Test data

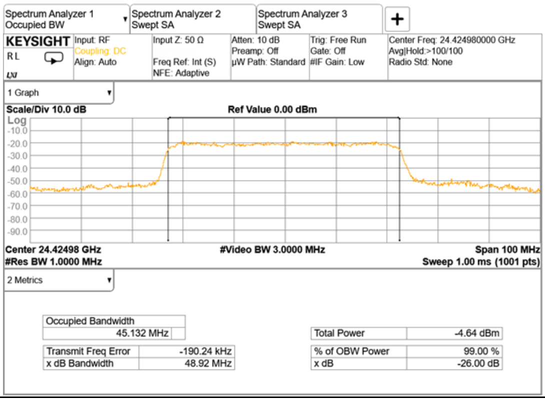
A.1 OBW

Antenna #0, Band n258a

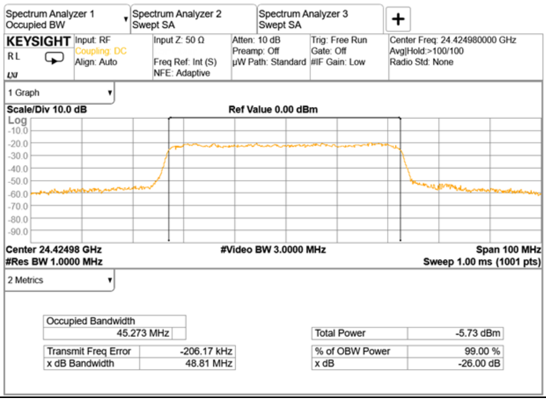
Bandwidth [MHz]	Transmission scheme	Modulation	OBW [MHz]
50	CP-OFDM	QPSK	45.132
50	CP-OFDM	16QAM	45.273
50	CP-OFDM	64QAM	45.211
50	DFT-s-OFDM	π/2-BPSK	45.340
50	DFT-s-OFDM	QPSK	45.188
50	DFT-s-OFDM	16QAM	45.199
50	DFT-s-OFDM	64QAM	45.016
100	CP-OFDM	QPSK	92.839
100	CP-OFDM	16QAM	93.287
100	CP-OFDM	64QAM	92.658
100	DFT-s-OFDM	π/2-BPSK	90.518
100	DFT-s-OFDM	QPSK	90.695
100	DFT-s-OFDM	16QAM	90.767
100	DFT-s-OFDM	64QAM	90.534

Antenna #0, n258a, 50 MHz

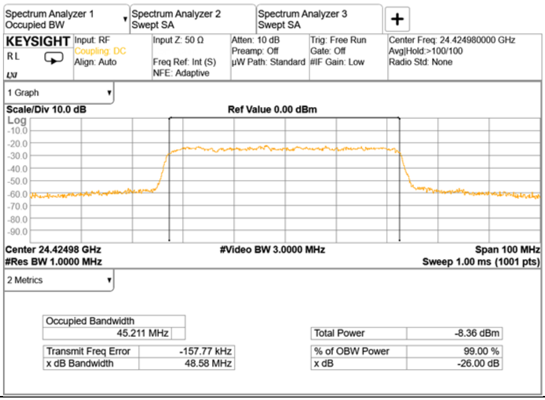
CP-OFDM, QPSK



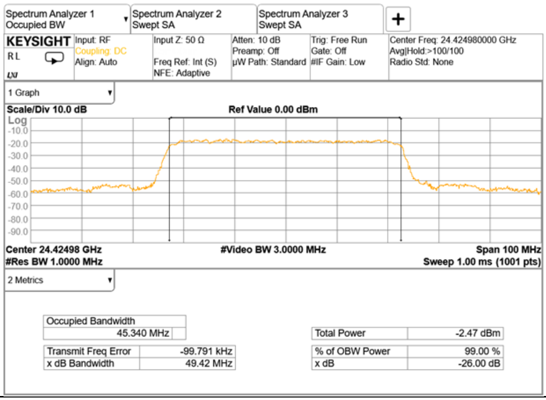
CP-OFDM, 16QAM



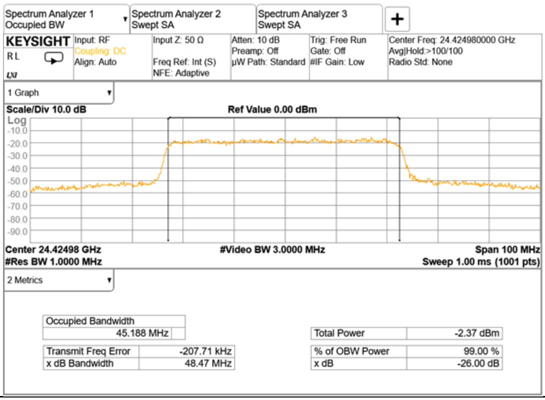
CP-OFDM, 64QAM



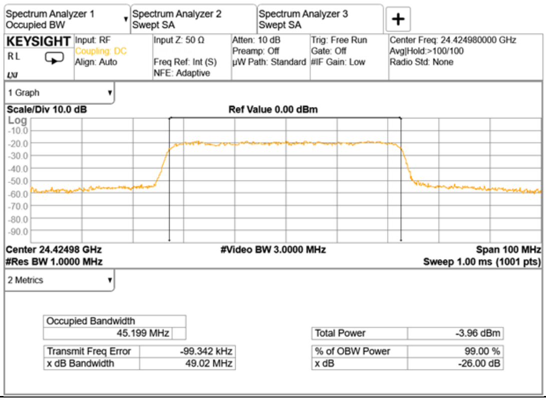
DFT-s-OFDM, π/2-BPSK



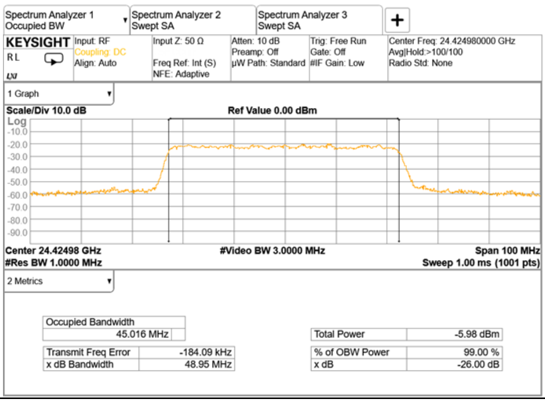
DFT-s-OFDM, QPSK



DFT-s-OFDM, 16QAM

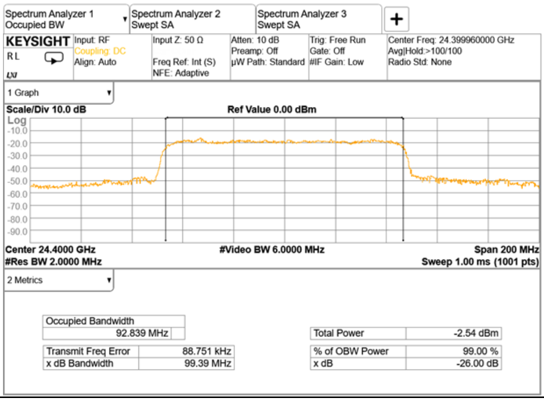


DFT-s-OFDM, 64QAM

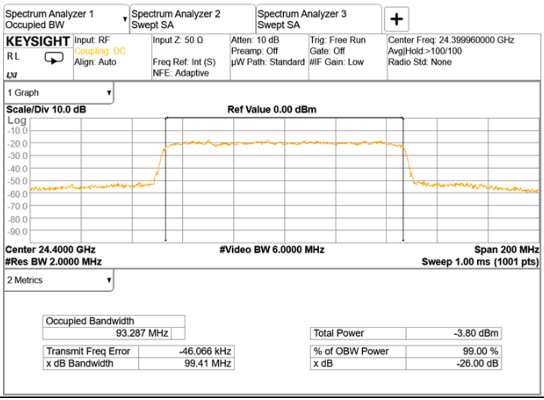


Antenna #0, n258a, 100 MHz

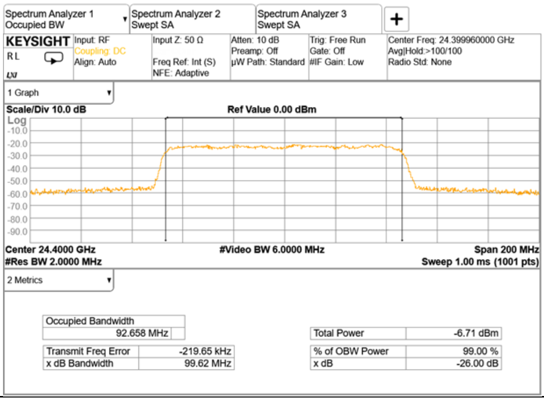
CP-OFDM, QPSK



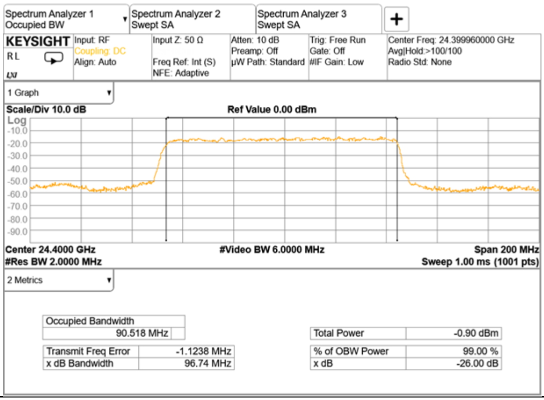
CP-OFDM, 16QAM



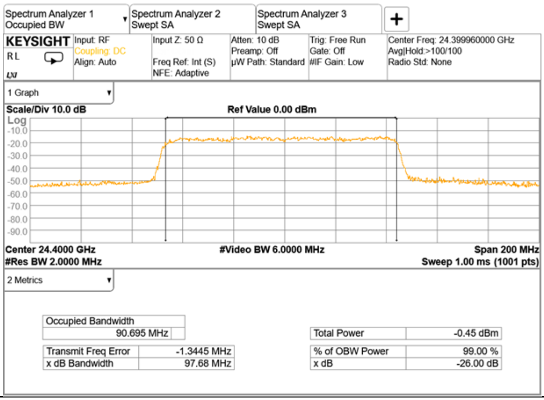
CP-OFDM, 64QAM



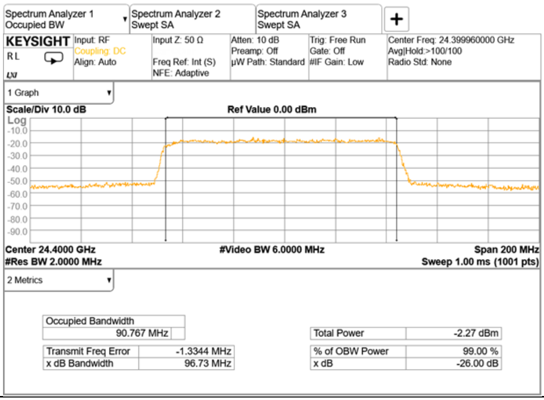
DFT-s-OFDM, π/2-BPSK



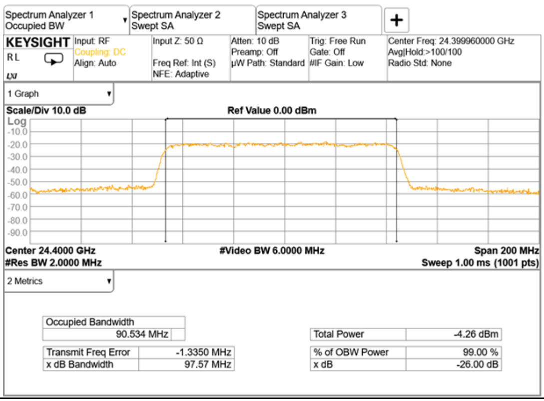
DFT-s-OFDM, QPSK



DFT-s-OFDM, 16QAM



DFT-s-OFDM, 64QAM

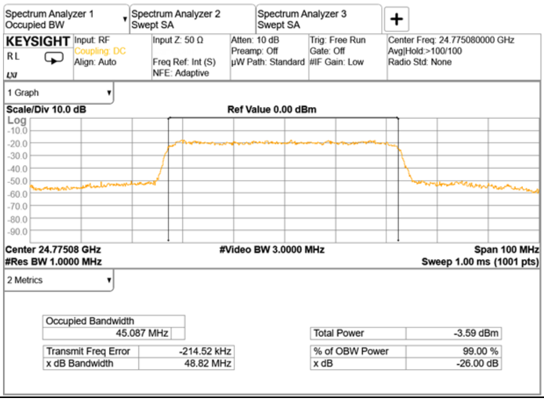


Antenna #0, Band n258b

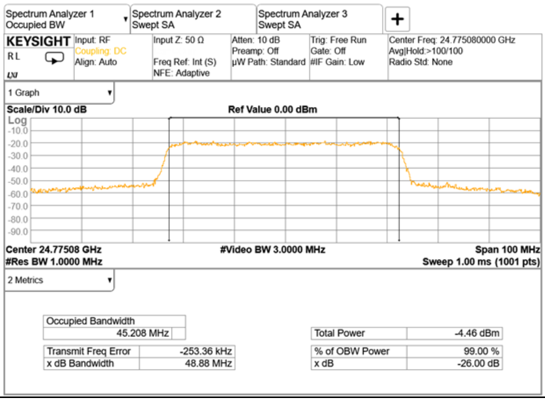
Bandwidth [MHz]	Transmission scheme	Modulation	OBW [MHz]
50	CP-OFDM	QPSK	45.087
50	CP-OFDM	16QAM	45.208
50	CP-OFDM	64QAM	45.221
50	DFT-s-OFDM	π/2-BPSK	45.328
50	DFT-s-OFDM	QPSK	45.303
50	DFT-s-OFDM	16QAM	45.230
50	DFT-s-OFDM	64QAM	45.041
100	CP-OFDM	QPSK	92.850
100	CP-OFDM	16QAM	93.323
100	CP-OFDM	64QAM	92.668
100	DFT-s-OFDM	π/2-BPSK	90.520
100	DFT-s-OFDM	QPSK	90.680
100	DFT-s-OFDM	16QAM	90.637
100	DFT-s-OFDM	64QAM	90.344

Antenna #0, n258b, 50 MHz

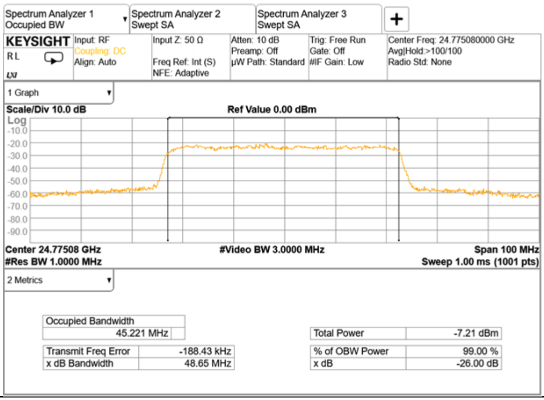
CP-OFDM, QPSK



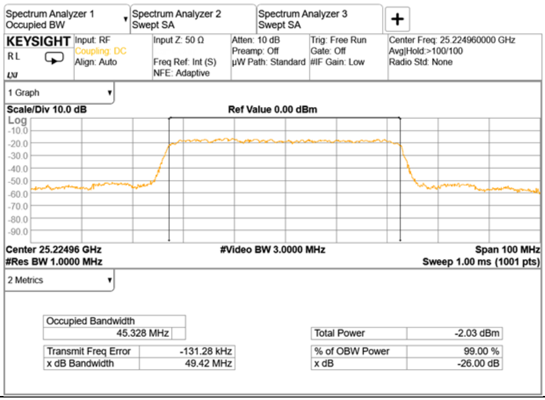
CP-OFDM, 16QAM



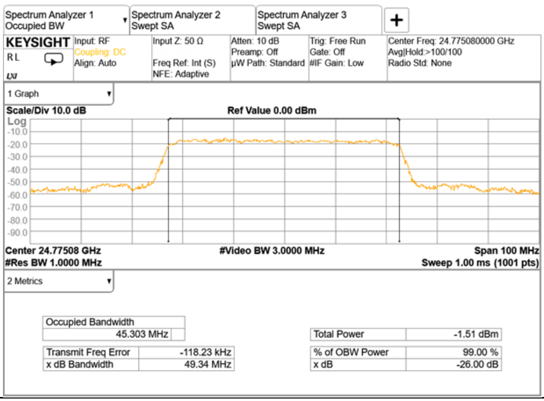
CP-OFDM, 64QAM



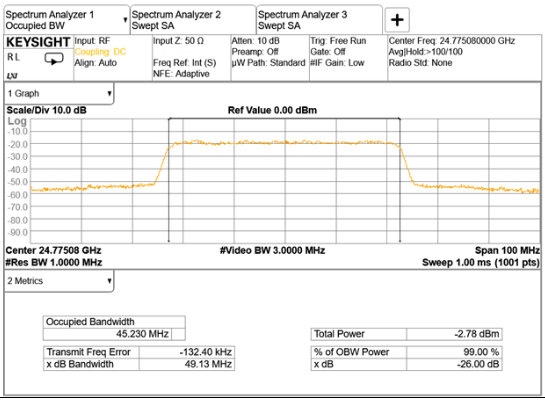
DFT-s-OFDM, π/2-BPSK



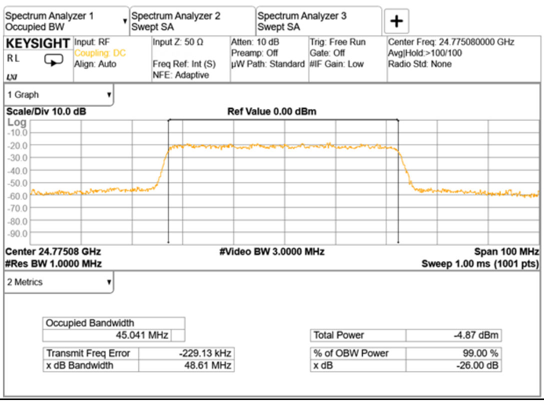
DFT-s-OFDM, QPSK



DFT-s-OFDM, 16QAM

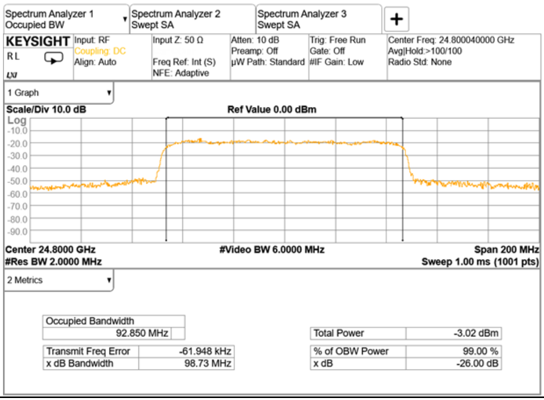


DFT-s-OFDM, 64QAM

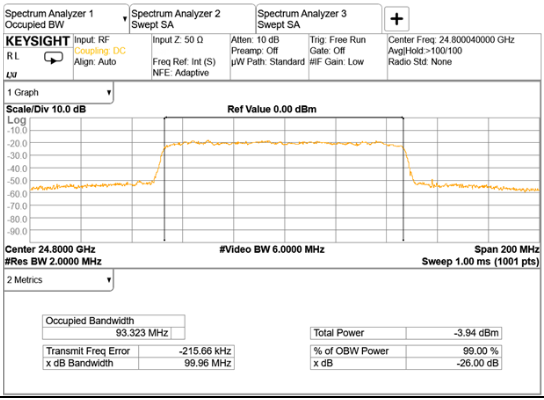


Antenna #0, n258b, 100 MHz

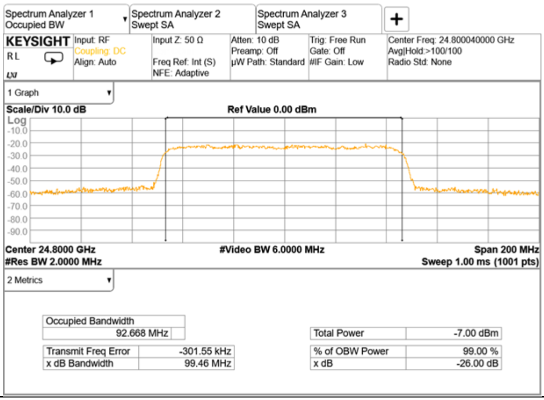
CP-OFDM, QPSK



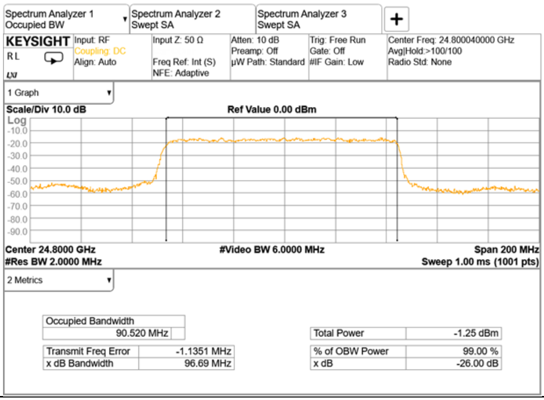
CP-OFDM, 16QAM



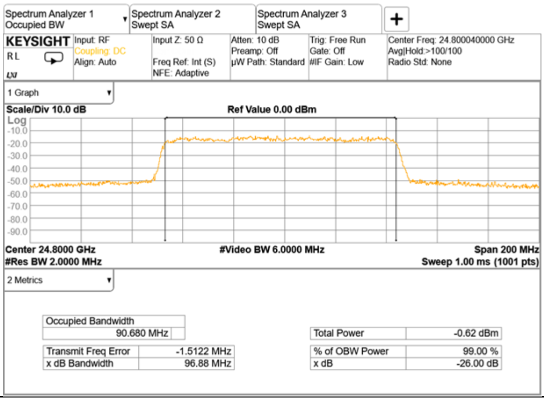
CP-OFDM, 64QAM



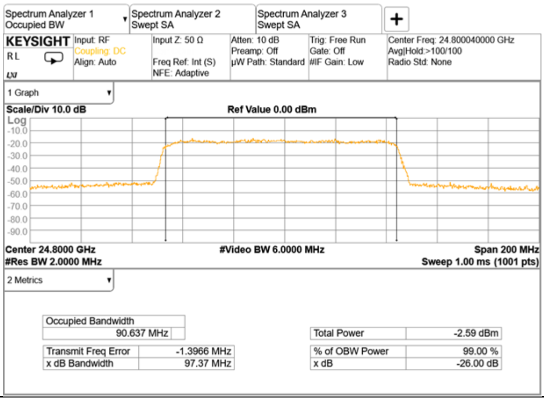
DFT-s-OFDM, π/2-BPSK



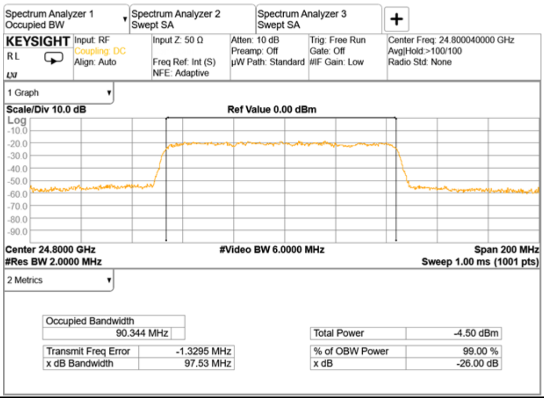
DFT-s-OFDM, QPSK



DFT-s-OFDM, 16QAM



DFT-s-OFDM, 64QAM

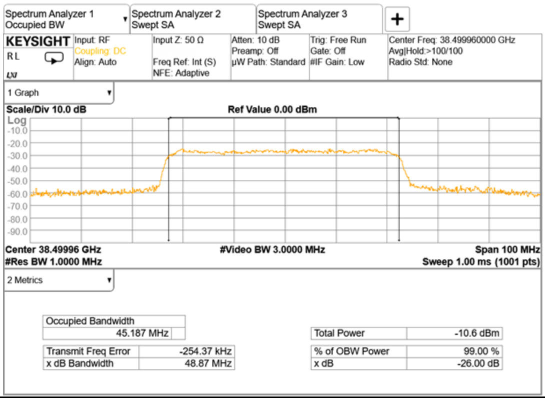


Antenna #0, Band n260

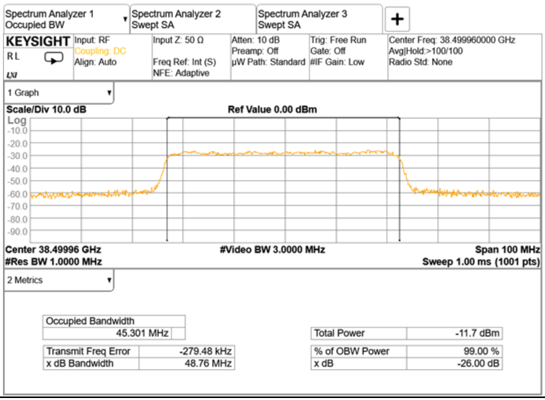
Bandwidth [MHz]	Transmission scheme	Modulation	OBW [MHz]
50	CP-OFDM	QPSK	45.187
50	CP-OFDM	16QAM	45.301
50	CP-OFDM	64QAM	45.160
50	DFT-s-OFDM	π/2-BPSK	45.315
50	DFT-s-OFDM	QPSK	45.179
50	DFT-s-OFDM	16QAM	45.232
50	DFT-s-OFDM	64QAM	45.064
100	CP-OFDM	QPSK	92.889
100	CP-OFDM	16QAM	93.191
100	CP-OFDM	64QAM	92.826
100	DFT-s-OFDM	π/2-BPSK	90.343
100	DFT-s-OFDM	QPSK	90.652
100	DFT-s-OFDM	16QAM	90.643
100	DFT-s-OFDM	64QAM	90.383

Antenna #0, n260, 50 MHz

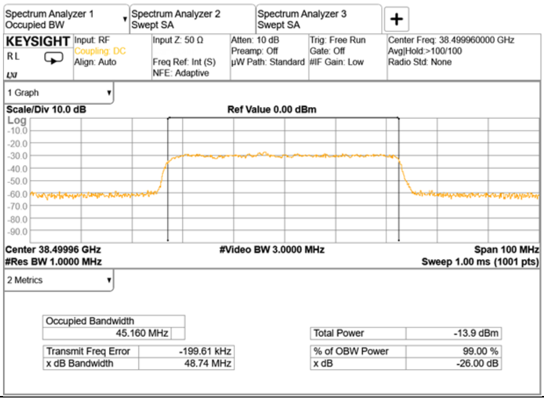
CP-OFDM, QPSK



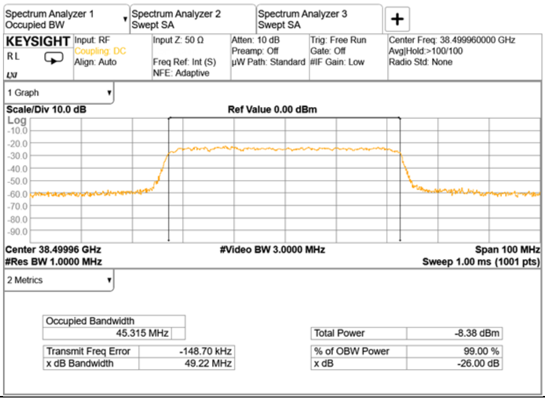
CP-OFDM, 16QAM



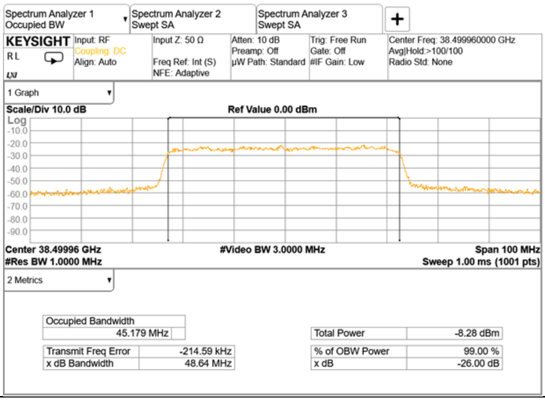
CP-OFDM, 64QAM



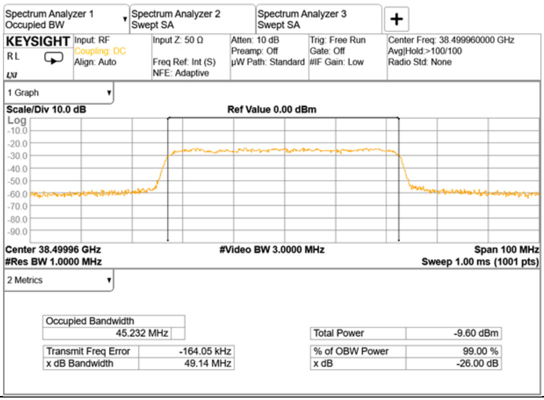
DFT-s-OFDM, π/2-BPSK



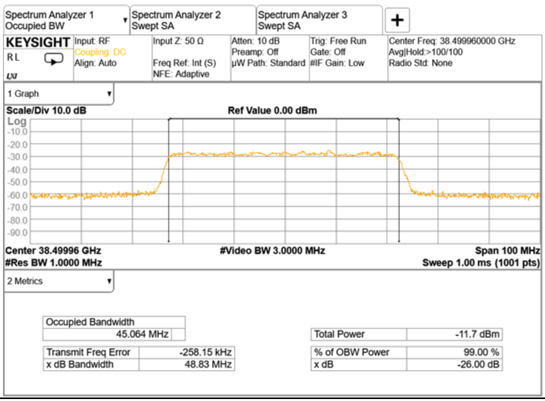
DFT-s-OFDM, QPSK



DFT-s-OFDM, 16QAM

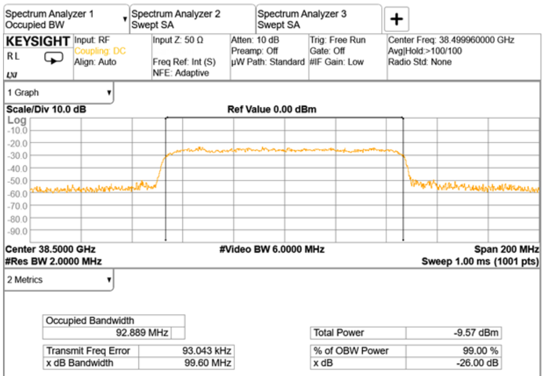


DFT-s-OFDM, 64QAM

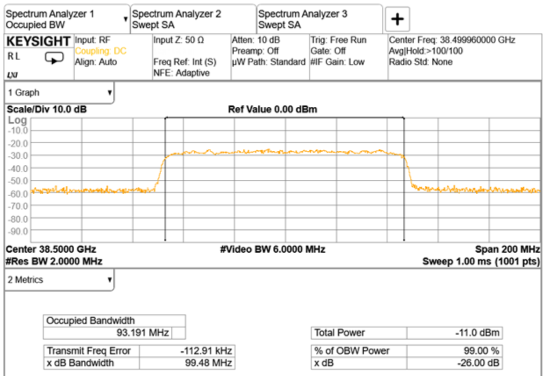


Antenna #0, n260, 100 MHz

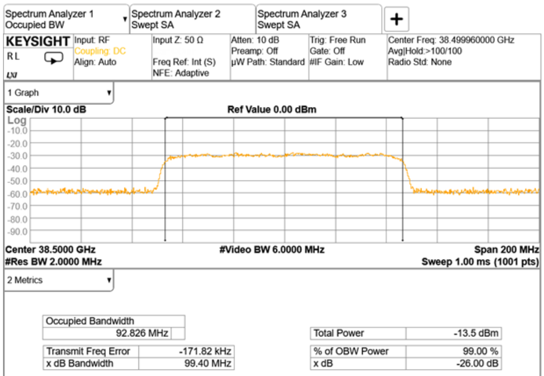
CP-OFDM, QPSK



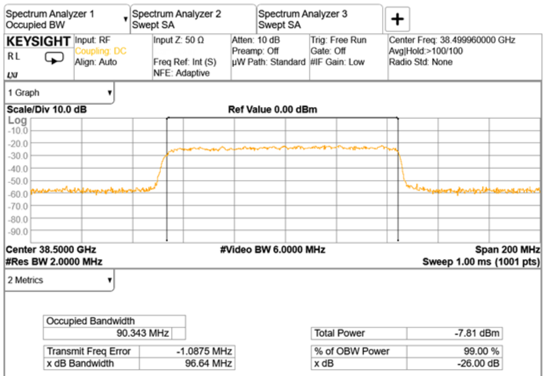
CP-OFDM, 16QAM



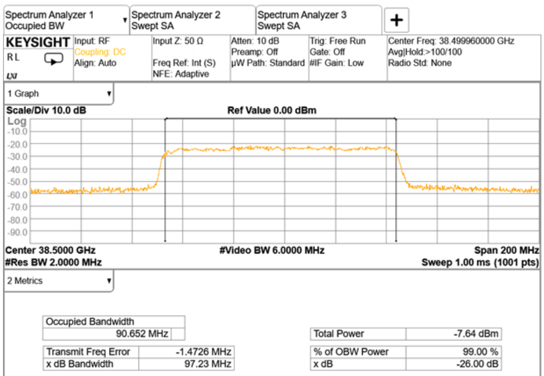
CP-OFDM, 64QAM



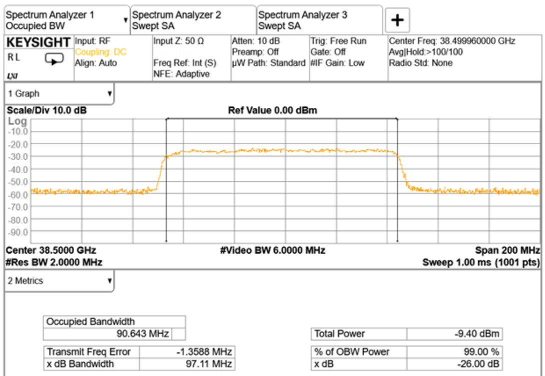
DFT-s-OFDM, π/2-BPSK



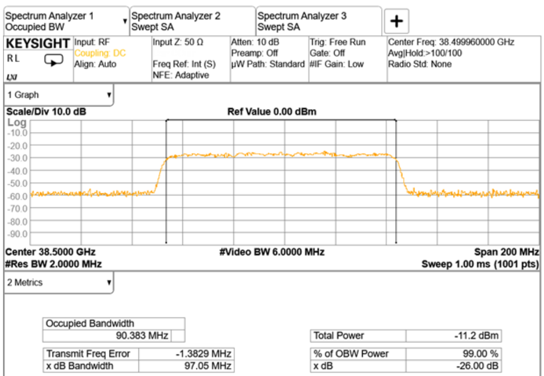
DFT-s-OFDM, QPSK



DFT-s-OFDM, 16QAM



DFT-s-OFDM, 64QAM

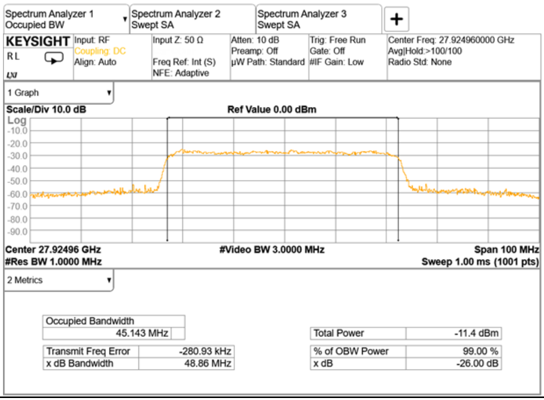


Antenna #0, Band n261

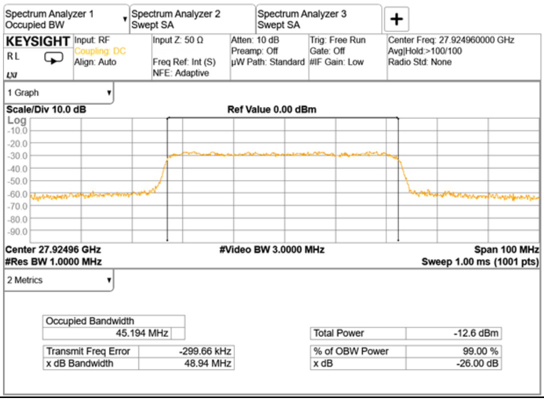
Bandwidth [MHz]	Transmission scheme	Modulation	OBW [MHz]
50	CP-OFDM	QPSK	45.143
50	CP-OFDM	16QAM	45.194
50	CP-OFDM	64QAM	45.206
50	DFT-s-OFDM	π/2-BPSK	45.346
50	DFT-s-OFDM	QPSK	45.237
50	DFT-s-OFDM	16QAM	45.219
50	DFT-s-OFDM	64QAM	45.043
100	CP-OFDM	QPSK	92.624
100	CP-OFDM	16QAM	93.196
100	CP-OFDM	64QAM	92.703
100	DFT-s-OFDM	π/2-BPSK	90.501
100	DFT-s-OFDM	QPSK	90.800
100	DFT-s-OFDM	16QAM	90.624
100	DFT-s-OFDM	64QAM	90.408

Antenna #0, n261, 50 MHz

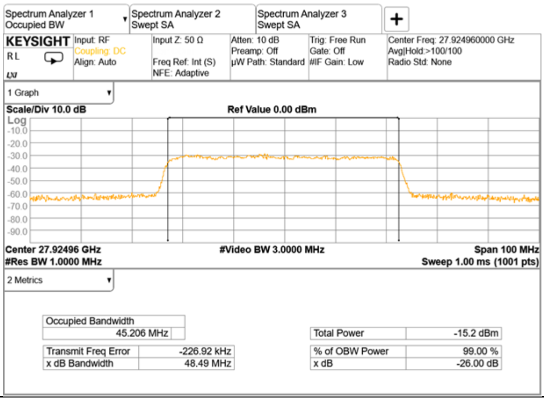
CP-OFDM, QPSK



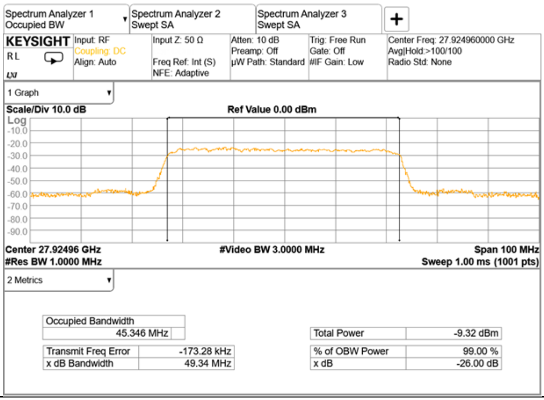
CP-OFDM, 16QAM



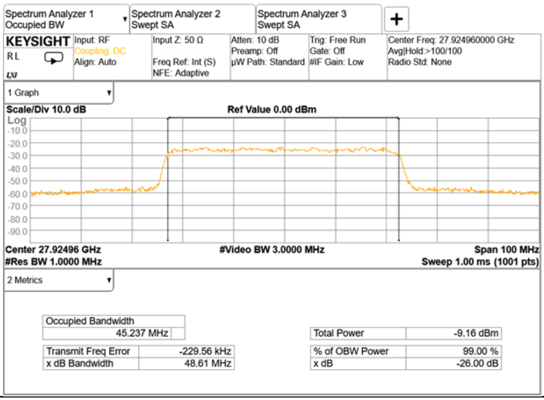
CP-OFDM, 64QAM



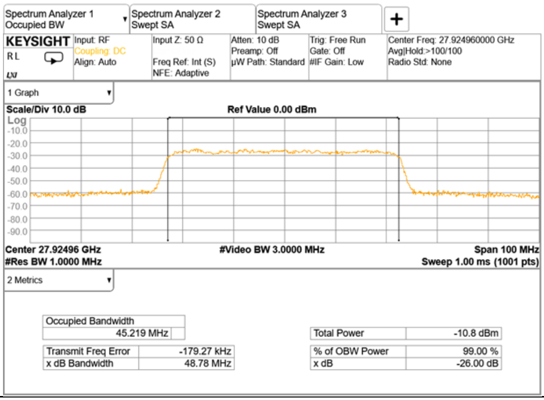
DFT-s-OFDM, π/2-BPSK



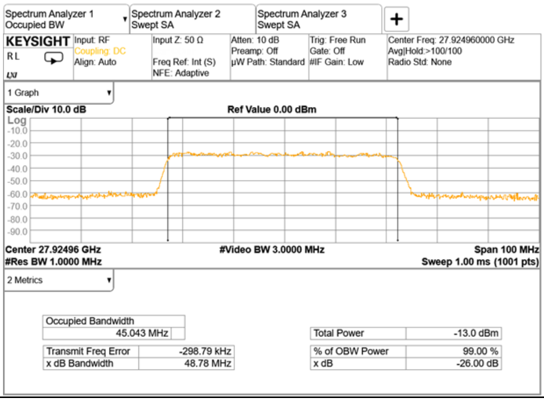
DFT-s-OFDM, QPSK



DFT-s-OFDM, 16QAM

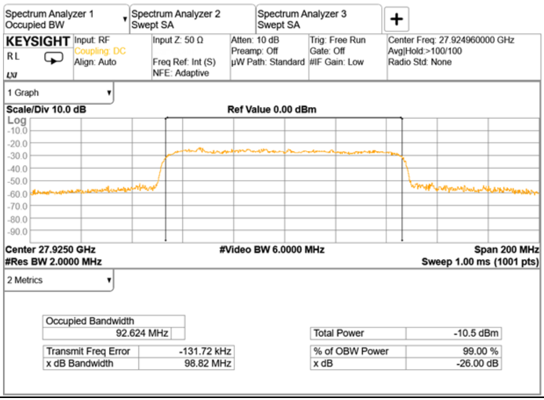


DFT-s-OFDM, 64QAM

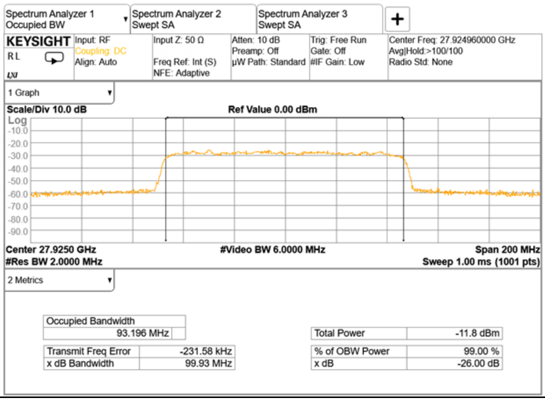


Antenna #0, n261, 100 MHz

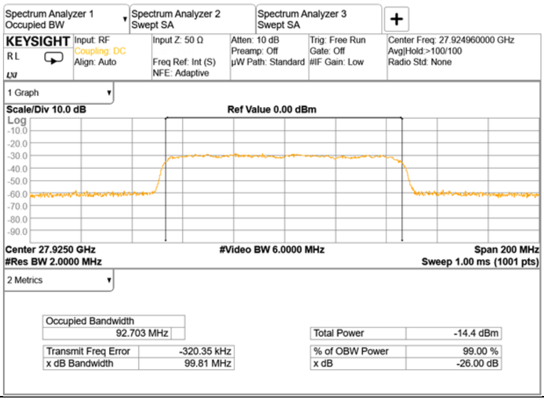
CP-OFDM, QPSK



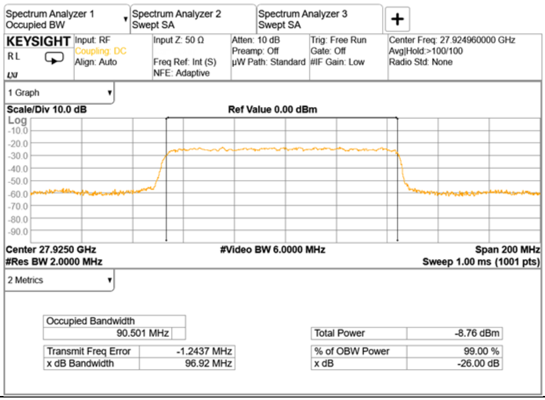
CP-OFDM, 16QAM



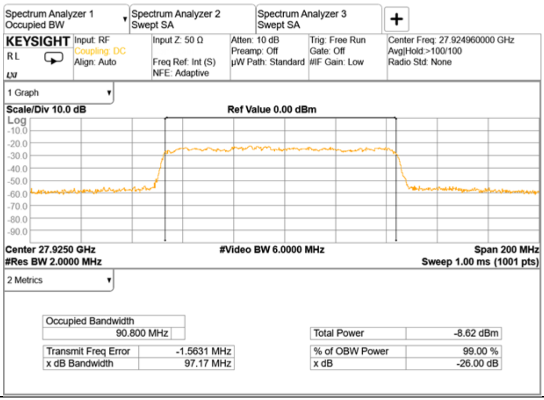
CP-OFDM, 64QAM



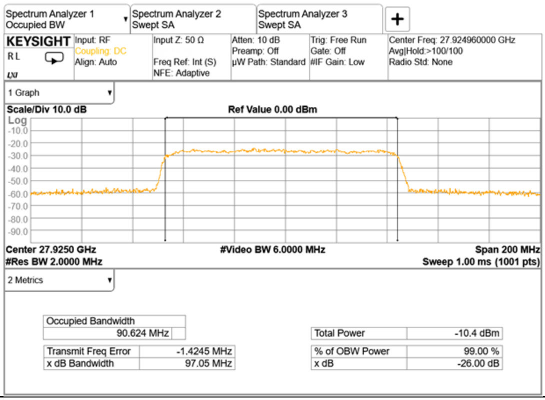
DFT-s-OFDM, π/2-BPSK



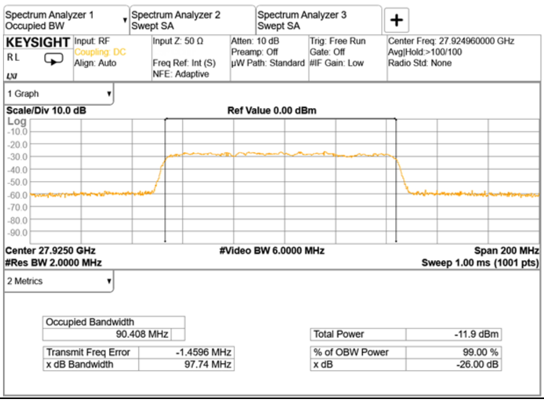
DFT-s-OFDM, QPSK



DFT-s-OFDM, 16QAM



DFT-s-OFDM, 64QAM

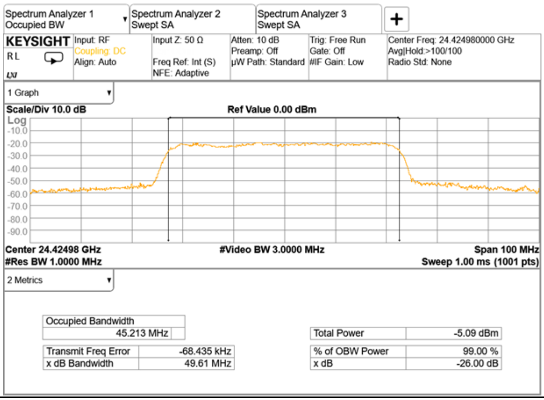


Antenna #1, Band n258a

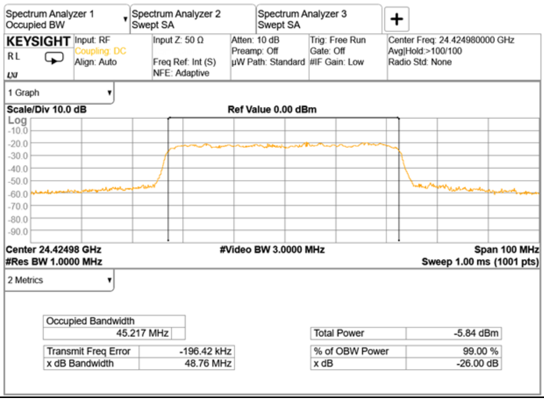
Bandwidth [MHz]	Transmission scheme	Modulation	OBW [MHz]
50	CP-OFDM	QPSK	45.213
50	CP-OFDM	16QAM	45.217
50	CP-OFDM	64QAM	45.201
50	DFT-s-OFDM	π/2-BPSK	45.197
50	DFT-s-OFDM	QPSK	45.526
50	DFT-s-OFDM	16QAM	45.157
50	DFT-s-OFDM	64QAM	45.274
100	CP-OFDM	QPSK	92.939
100	CP-OFDM	16QAM	93.107
100	CP-OFDM	64QAM	92.927
100	DFT-s-OFDM	π/2-BPSK	90.510
100	DFT-s-OFDM	QPSK	90.178
100	DFT-s-OFDM	16QAM	90.718
100	DFT-s-OFDM	64QAM	90.401

Antenna #1, n258a, 50 MHz

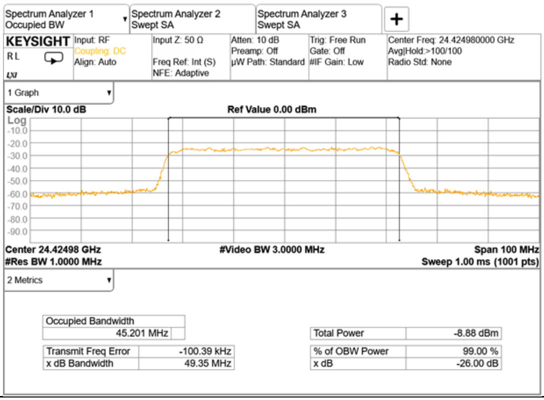
CP-OFDM, QPSK



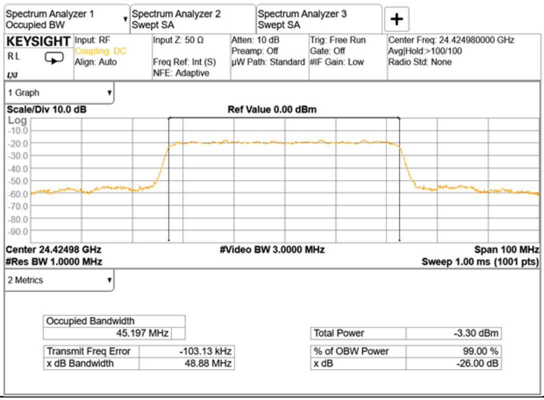
CP-OFDM, 16QAM



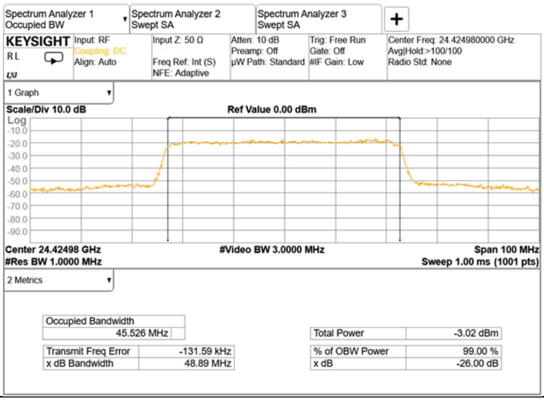
CP-OFDM, 64QAM



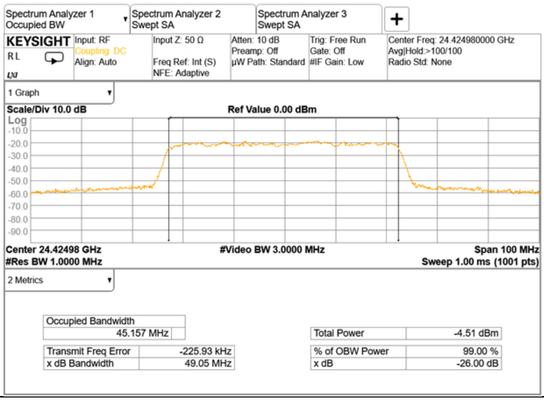
DFT-s-OFDM, π/2-BPSK



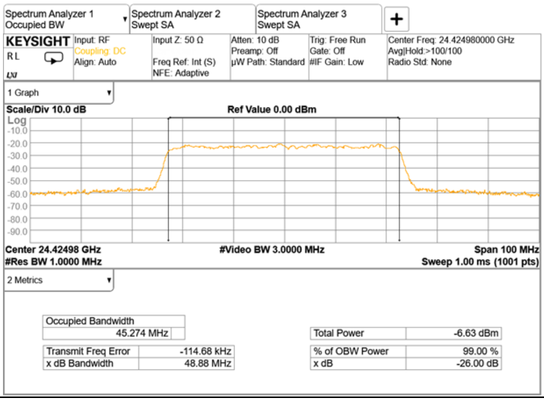
DFT-s-OFDM, QPSK



DFT-s-OFDM, 16QAM

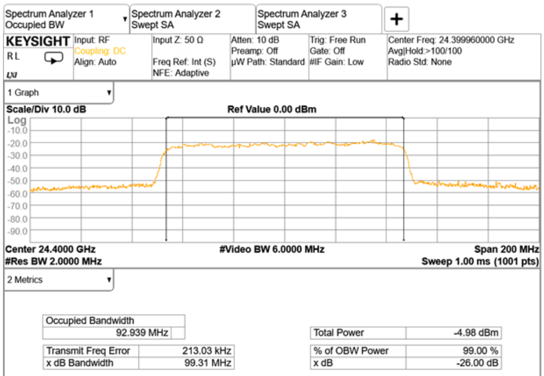


DFT-s-OFDM, 64QAM

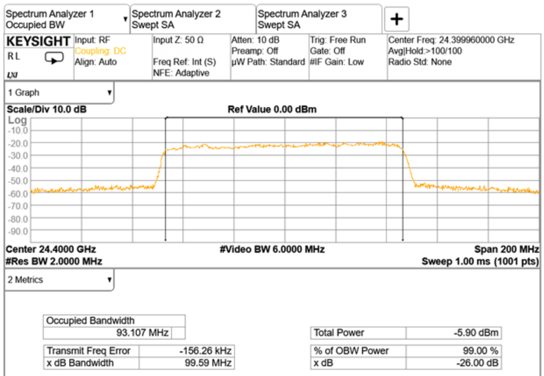


Antenna #1, n258a, 100 MHz

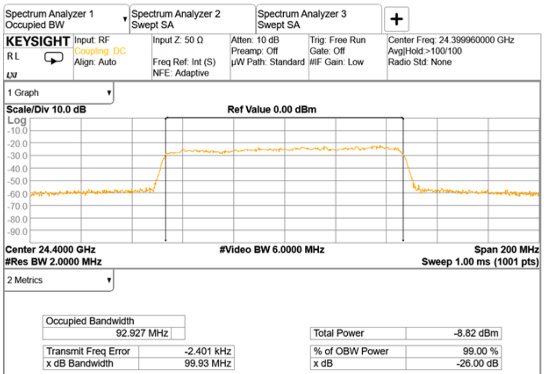
CP-OFDM, QPSK



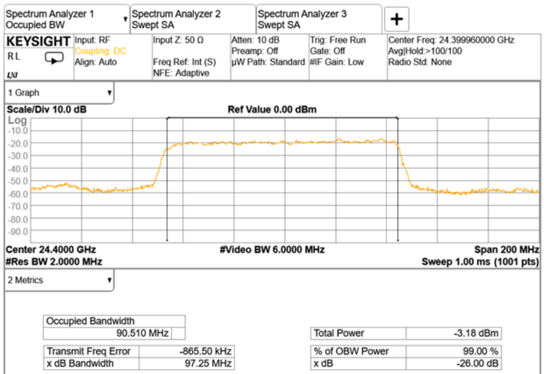
CP-OFDM, 16QAM



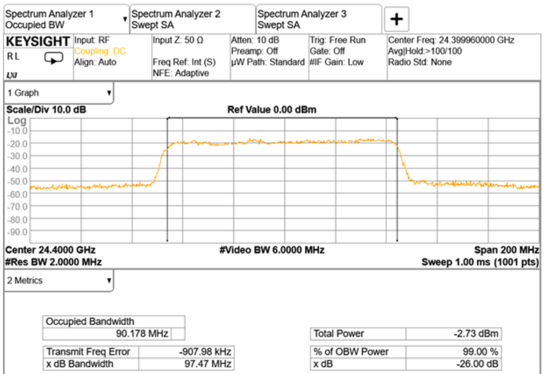
CP-OFDM, 64QAM



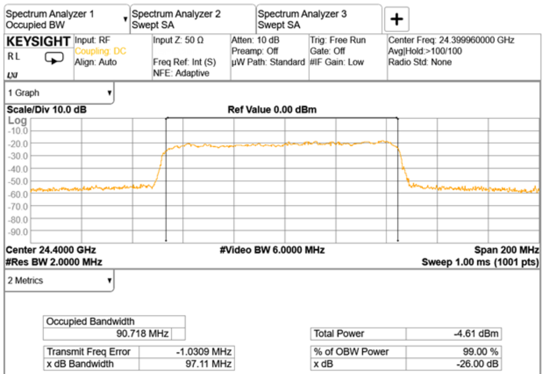
DFT-s-OFDM, π/2-BPSK



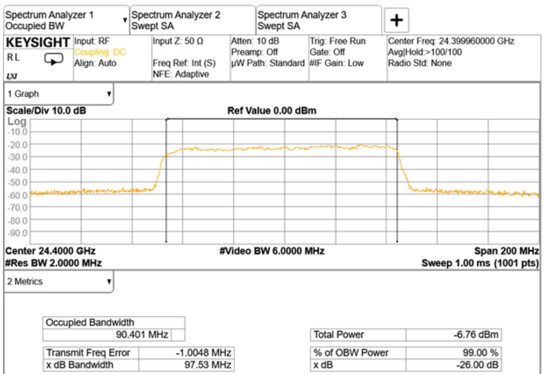
DFT-s-OFDM, QPSK



DFT-s-OFDM, 16QAM



DFT-s-OFDM, 64QAM



Antenna #1, Band n258b

Bandwidth [MHz]	Transmission scheme	Modulation	OBW [MHz]
50	CP-OFDM	QPSK	45.289
50	CP-OFDM	16QAM	45.216
50	CP-OFDM	64QAM	45.356
50	DFT-s-OFDM	π/2-BPSK	45.046
50	DFT-s-OFDM	QPSK	45.117
50	DFT-s-OFDM	16QAM	45.342
50	DFT-s-OFDM	64QAM	45.074
100	CP-OFDM	QPSK	93.011
100	CP-OFDM	16QAM	93.043
100	CP-OFDM	64QAM	92.809
100	DFT-s-OFDM	π/2-BPSK	90.546
100	DFT-s-OFDM	QPSK	90.183
100	DFT-s-OFDM	16QAM	90.943
100	DFT-s-OFDM	64QAM	90.524