RADIO TEST REPORT

Test Report No. : 13395143H-B-R1

Applicant	:	**Panasonic Corporation of North America**
Type of EUT	:	**Body Worn Camera**
Model Number of EUT	:	**WV-BWC4000**
FCC ID	:	**ACJ9TAWV-BWC4000**
Test regulation	:	**FCC Part 15 Subpart E: 2020 (Except for DFS test)**
Test Result	:	**Complied (Refer to SECTION 3.2)**

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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.
10. This report is a revised version of 13395143H-B. 13395143H-B is replaced with this report.

Date of test: June 8 to September 19, 2020

Representative test engineer:
Junki Nagatomi
Engineer
Consumer Technology Division

Approved by:
Tsubasa Takayama
Leader
Consumer Technology Division

CERTIFICATE 5107.02

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

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REVISION HISTORY

Original Test Report No.: 13395143H-B

Revision	Test report No.	Date	Page revised	Contents
- (Original)	13395143H-B	August 24, 2020	-	-
1	13395143H-B-R1	September 23, 2020	P11	Added explanatory note *3); "*3) For the U-NII-2C high channels including straddle channels, the test was conducted on the mode that had higher output power."
1	13395143H-B-R1	September 23, 2020	P12 - 13	Corrected Model number of Item No. A; WV-BWC-4000 →WV-BWC4000
1	13395143H-B-R1	September 23, 2020	P83 - 84, P98 - 99	Added data for band edge of 5280 MHz (11ac-20) and 5310 MHz (11ac-40)
1	13395143H-B-R1	September 23, 2020	P118	Added test instruments used September 19, 2020

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

CONTENTS **PAGE**

SECTION 1: Customer information

Applicant

Company Name	Panasonic Corporation of North America	
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Contact Person	Vir Angelo Lontoc	Ben Botros
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Facsimile Number	+1-201-392-4564	-
E-mail	virangelo.lontoc@us.panasonic.com	Ben.Botros@us.panasonic.com

Manufacturer

Company Name	Panasonic i-PRO Sensing Solutions Co., Ltd.
Address	1-62, 4-chome, Minoshima, Hakata-ku, Fukuoka 812-8531 Japan
Telephone Number	+81-80-3358-7203
Contact Person	Koji Yamasaki

*Remarks:
Panasonic Corporation of North America designates Panasonic i-PRO Sensing Solutions Co., Ltd. as manufacturer of the product (Body Worn Camera).

The information provided from the customer is as follows;
- Applicant, Type of EUT, Model Number of EUT, 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.

SECTION 2: Equipment under test (EUT)

2.1 Identification of EUT

Type	:	Body Worn Camera
Model Number	:	WV-BWC4000
Serial Number	:	Refer to SECTION 4.2
Rating	:	DC 3 V to DC 4.15 V < Rechargeable Li-ion Battery Pack > Model: WV-BWC40B1 Nominal Voltage: DC 3.6 V Rated Capacity: 2670mAh, 9.6Wh
Receipt Date	:	June 1, 2020
Country of Mass-production	:	Japan
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: WV-BWC4000 (referred to as the EUT in this report) is a Body Worn Camera.

Radio Specification

Specification of Wireless LAN (IEEE802.11b/g/a/n-20/n-40/11ac-20/11ac-40/11ac-80)

Type of radio	IEEE802.11b	IEEE802.11g/n (20 M band)	IEEE802.11a/n/ac (20 M band)	IEEE802.11n/ac (40 M band)	IEEE802.11ac (80 M band)
Equipment Type	Transceiver				
Frequency of operation	2412 MHz - 2462 MHz	2412 MHz - 2462 MHz	5280 MHz - 5320 MHz 5500 MHz - 5580 MHz 5660 MHz - 5720 MHz 5745 MHz - 5825 MHz	5310 MHz 5510 MHz - 5550 MHz 5670 MHz - 5710 MHz 5755 MHz - 5795 MHz	5530 MHz 5690 MHz 5775 MHz
Type of modulation	DSSS (CCK, DQPSK, DBPSK)	OFDM-CCK (64QAM, 16QAM, QPSK, BPSK)	OFDM (64QAM, 16QAM, QPSK, BPSK, 256QAM(IEEE802.11ac only))		
Channel spacing	5 MHz		20 MHz	40 MHz	80 MHz
Bandwidth	20MHz		20 MHz	40 MHz	80 MHz
Antenna type	2.4 GHz: FPC Antenna 5 GHz: Pattern Antenna				
Antenna Gain	2.4 GHz: 1.5 dBi 5 GHz: 4 dBi				
Operating temperature range	-20 deg. C. to +50 deg. C.				

Specification of Bluetooth (Low Energy: LE)

	Bluetooth
Equipment Type	Transceiver
Frequency of operation	2402 MHz -2480 MHz
Type of modulation	GFSK
Bandwidth & Channel spacing	Bandwidth : 1 MHz Channel spacing : 2 MHz
Antenna type	FPC Antenna
Antenna Gain	1.5 dBi
Operating temperature range	-20 deg. C. to +50 deg. C.

GNSS

Radio Type : Receiver
Frequency of Operation : See table below.
Antenna type : Active Antenna
Antenna Gain : 8.56 dBic

Supported GNSS and GNSS signals

GNSS	RNSS Frequency Band / Frequency [MHz]		
	1559 to 1610	1215 to 1300	1164 to 1215
BDS	☐B1I 1561.098	-	-
Galileo	☐E1 1575.42	☐E6 1278.75	☐E5a 1176.45 ☐E5b 1207.14
GLONASS	☐G1 1598.0625 - 1605.375	☐G2 1242.9375 - 1248.625	-
GPS	☒L1 1575.42	☐L2 1227.6	☐L5 1176.45
SBAS	☐L1 1575.42	-	☐L5 1176.45

☒ Supported GNSS signal
☐ Not supported GNSS signal

* This test report applies to Wireless LAN (5 GHz Band).
* Wireless LAN and Bluetooth Low Energy do not transmit simultaneously.

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart E
FCC Part 15 final revised on June 26, 2020 and effective July 27, 2020 except 15.258

Title : FCC 47 CFR Part 15 Radio Frequency Device Subpart E
Unlicensed National Information Infrastructure Devices
Section 15.407 General technical requirements

* The revision does not affect the test result conducted before its effective date.

3.2 Procedures and results

Item	Test Procedure	Specification	Worst margin	Results	Remarks
Conducted Emission	**FCC:** ANSI C63.10-2013	**FCC:** 15.407 (b) (6) / 15.207	15.00 dB, 0.48580 MHz, N, AV	Complied a)	-
	ISED: RSS-Gen 8.8	**ISED:** RSS-Gen 8.8			
26 dB Emission Bandwidth	**FCC:** KDB Publication Number 789033	**FCC:** 15.407 (a) (1) (2) (3)	See data	Complied b)	Conducted
	ISED: -	**ISED:** -			
Maximum Conducted Output Power	**FCC:** KDB Publication Number 789033	**FCC:** 15.407 (a) (1) (2) (3)		Complied c)	Conducted
	ISED: -	**ISED:** RSS-247 6.2.1.1 6.2.2.1 6.2.3.1 6.2.4.1			
Maximum Power Spectral Density	**FCC:** KDB Publication Number 789033	**FCC :** 15.407 (a) (1) (2) (3)		Complied d)	Conducted
	ISED: -	**ISED:** RSS-247 6.2.1.1 6.2.2.1 6.2.3.1 6.2.4.1			
Spurious Emission Restricted Band Edge	**FCC:** ANSI C63.10-2013 KDB Publication Number 789033	**FCC:** 15.407 (b), 15.205 and 15.209	0.3 dB 5350.000 MHz, AV, Vertical	Complied# e) / f)	Conducted (< 30 MHz) / Radiated (> 30 MHz) *1)
	ISED: -	**ISED:** RSS-247 6.2.1.2 6.2.2.2 6.2.3.2 6.2.4.2			
6 dB Emission Bandwidth	**FCC:** ANSI C63.10-2013	**FCC:** 15.407 (e)	See data	Complied g)	Conducted
	ISED: -	**ISED:** RSS-247 6.2.4.1			

Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422.
*1) Radiated test was selected over 30 MHz based on FCC 15.407 (b) and KDB 789033 D02 G.3.b).

a) Refer to APPENDIX 1 (data of Conducted Emission)
b) Refer to APPENDIX 1 (data of 26 dB Emission Bandwidth and 99 % Occupied Bandwidth)
c) Refer to APPENDIX 1 (data of Maximum Conducted Output Power)
d) Refer to APPENDIX 1 (data of Maximum Power Spectral Density)
e) Refer to APPENDIX 1 (data of Radiated Spurious Emission)
f) Refer to APPENDIX 1 (data of Conducted Spurious Emission)
g) Refer to APPENDIX 1 (data of 6 dB Bandwidth)

Symbols:
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.

* In case any questions arise about test procedure, ANSI C63.10: 2013 is also referred.

FCC Part 15.31 (e)
The test was performed with the New Battery and the stable voltage was supplied to the EUT during the tests. Therefore, the EUT complies with the requirement.

FCC Part 15.203 Antenna requirement
It is impossible for end users to replace the antenna, because the antenna is mounted inside of the EUT. Therefore, the equipment complies with the antenna requirement of Section 15.203.

3.3 Addition to standard

Item	Test Procedure	Specification	Worst margin	Results	Remarks
99 % Occupied Band Width	**ISED:** RSS-Gen 6.7	**ISED:** -	N/A	- a)	Conducted
a) Refer to APPENDIX 1 (data of 26 dB Emission Bandwidth and 99 % Occupied Bandwidth)					

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 following 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.
Ise EMC Lab.

Conducted emission

using Item	Frequency range	Uncertainty (+/-)
AMN (LISN)	0.009 MHz to 0.15 MHz	3.4 dB
	0.15 MHz to 30 MHz	2.9 dB

Radiated emission

Measurement distance	Frequency range		Uncertainty (+/-)
3 m	9 kHz to 30 MHz		3.3 dB
10 m			3.2 dB
3 m	30 MHz to 200 MHz	(Horizontal)	4.8 dB
		(Vertical)	5.0 dB
	200 MHz to 1000 MHz	(Horizontal)	5.2 dB
		(Vertical)	6.3 dB
10 m	30 MHz to 200 MHz	(Horizontal)	4.8 dB
		(Vertical)	4.8 dB
	200 MHz to 1000 MHz	(Horizontal)	5.0 dB
		(Vertical)	5.0 dB
3 m	1 GHz to 6 GHz		4.9 dB
	6 GHz to 18 GHz		5.2 dB
1 m	10 GHz to 26.5 GHz		5.5 dB
	26.5 GHz to 40 GHz		5.5 dB
0.5 m	26.5 GHz to 40 GHz		5.5 dB
10 m	1 GHz to 18 GHz		5.2 dB

Antenna Terminal test

Test Item	Uncertainty (+/-)
26 dB Emission Bandwidth / 6 dB Emission Bandwidth /	0.96 %
Maximum Conducted Output Power / Average Output Power	1.4 dB
Burst Rate	0.10 %
Maximum Power Spectral Density	2.6 dB
Spurious Emission (Conducted)	2.6 dB

3.5 Test Location

UL Japan, Inc. Ise EMC Lab.
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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.11 measurement room	6.2 x 4.7 x 3.0	4.8 x 4.6	-	-

* 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.

SECTION 4: Operation of EUT during testing

4.1 Operating Mode(s)

Test operating mode was determined as follows according to "Section 1 of 6 802.11 a/b/g/n testing - Managing Complex Regulatory Approvals -" of TCB Council Workshop October 2009 and also was judged the necessity of 802.11ac mode by the pre-test.

Mode	Remarks*
IEEE 802.11a (11a)	48 Mbps, PN9
IEEE 802.11n SISO 20 MHz BW (11n-20)	MCS 6 (Long GI, 1 Streams), PN9
IEEE 802.11ax SISO 20 MHz BW (11ac-20)	MCS 8 (Long GI, 1 Streams), PN9
IEEE 802.11n SISO 40 MHz BW (11n-40)	MCS 3 (Long GI, 1 Streams), PN9
IEEE 802.11ac SISO 40 MHz BW (11ac-40)	MCS 8 (Long GI, 1 Streams), PN9
IEEE 802.11ac SISO 80 MHz BW (11ac-80)	MCS 7 (Long GI, 1 Streams), PN9
*The worst condition was determined based on the test result of Maximum Peak Output Power (Mid Channel)	
*Power of the EUT was set by the software as follows; Power settings: See Table 1 Software: Teraterm, Version 4.87 (Date: May 31, 2015 / Storage location: Driven by connected PC) *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.	

[Table 1: Power settings]

Mode	Power (max) [dBm]		
	5.3 GHz Band	5.5 GHz Band	5.8 GHz Band
11a	12	12	12
11n-20 / ac-20	12	12	12
11n-40 / ac-40	11.5	11.5	11.5
11ac-80	10.5	10.5	10.5

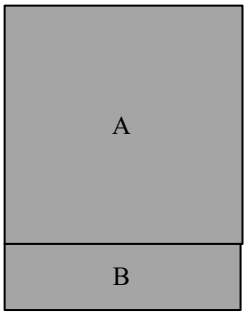
*The details of Operation mode(s)

Test Item	Operating Mode	Tested Antenna	Tested Frequency			
			Lower Band	Middle Band	Additional Band	Upper Band
Conducted emission Radiated Spurious Emission (Below 1 GHz) Conducted Spurious Emission	11ac-20 Tx *1)	1	-	-	5580 MHz	-
26 dB Emission Bandwidth	11a Tx 11n-20 Tx 11ac-20 Tx	1	-	5280 MHz 5300 MHz 5320 MHz	5500 MHz 5580 MHz 5700 MHz 5720 MHz	-
	11n-40 Tx 11ac-40 Tx	1	-	5310 MHz	5510 MHz 5550 MHz 5670 MHz 5710 MHz	-
	11ac-80 Tx	1	-	-	5530 MHz 5690 MHz	-
99 % Occupied Bandwidth, Maximum Conducted Output Power, Maximum Power Spectral Density	11a Tx 11n-20 Tx 11ac-20 Tx	1	-	5280 MHz 5300 MHz 5320 MHz	5500 MHz 5580 MHz 5700 MHz 5720 MHz	5745 MHz 5785 MHz 5825 MHz
	11n-40 Tx 11ac-40 Tx	1	-	5310 MHz	5510 MHz 5550 MHz 5670 MHz 5710 MHz	5755 MHz 5795 MHz
	11ac-80 Tx	1	-	-	5530 MHz 5690 MHz	5775 MHz
6 dB Bandwidth	11a Tx 11n-20 Tx 11ac-20 Tx	1	-	-	-	5745 MHz 5785 MHz 5825 MHz
	11n-40 Tx 11ac-40 Tx	1	-	-	-	5755 MHz 5795 MHz
	11ac-80 Tx	1	-	-	-	5775 MHz
Radiated Spurious Emission (Above 1 GHz)	11ac-20 Tx *2) *3)	1	-	5280 MHz 5300 MHz 5320 MHz	5500 MHz 5580 MHz 5700 MHz	5745 MHz 5785 MHz 5825 MHz
	11ac-40 Tx *2) *3)	1	-	5310 MHz	5510 MHz 5550 MHz 5670 MHz	5755 MHz 5795 MHz
	11ac-80 Tx	1	-	-	5530 MHz 5690 MHz	5775 MHz

*1) The mode was tested as a representative, because it had the highest power at antenna terminal test.
*2) Since 11n-20 and 11ac-20, 11n-40 and 11ac-40, have the same modulation method and no differences in transmitting specification, test was performed on the representative mode that had the highest output power.
*3) For the U-NII-2C high channels including straddle channels, the test was conducted on the mode that had higher output power.

4.2 Configuration and peripherals

For Conducted Emission and Radiated Spurious Emission tests

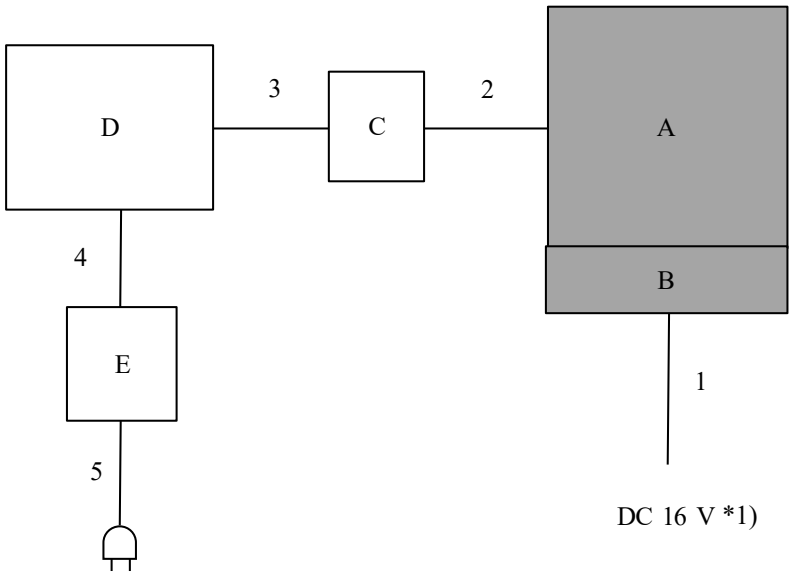


* Cabling and setup(s) were taken into consideration and test data was taken under worse case conditions.

Description of EUT

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Body Worm Camera	WV-BWC4000	52	Panasonic i-PRO Sensing Solutions Co.,Ltd.	EUT
B	Rechargeable Li-ion Battery Pack	WV-BWC40B1	20031170056	Panasonic i-PRO Sensing Solutions Co.,Ltd.	EUT

For Antenna Terminal Conducted Tests



* Cabling and setup(s) were taken into consideration and test data was taken under worse case conditions.
*1) The test was conducted while charging the battery (DC 16 V). DC 3.6 V is constantly supplied to the EUT through the battery.

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Body Worm Camera	WV-BWC4000	48	Panasonic i-PRO Sensing Solutions Co.,Ltd.	EUT
B	Rechargeable Li-ion Battery Pack	WV-BWC40B1	20031170033	Panasonic i-PRO Sensing Solutions Co.,Ltd.	EUT
C	Jig	-	-	-	-
D	Laptop PC	CF-N8HWCDPS	9LKSA04258	Panasonic	-
E	AC Adapter	CF-AA6372B	6372BM409X14 190B	Panasonic	-

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	DC Cable	0.60	Unshielded	Unshielded	-
2	Signal Cable	0.17	Unshielded	Unshielded	-
3	USB Cable	2.00	Shielded	Shielded	-
4	DC Cable	1.00	Unshielded	Unshielded	-
5	AC Cable	1.00	Unshielded	Unshielded	-

SECTION 5: Conducted Emission

Test Procedure and conditions

EUT was placed on a urethane platform of nominal size, 1.0 m by 1.5 m, raised 0.8 m above the conducting ground plane. The rear of tabletop was located 40cm to the vertical conducting plane. The rear of EUT, including peripherals aligned and flushed with rear of tabletop. All other surfaces of tabletop were at least 80cm from any other grounded conducting surface. EUT was located 80cm from a Line Impedance Stabilization Network (LISN) / Artificial mains Network (AMN) and excess AC cable was bundled in center.

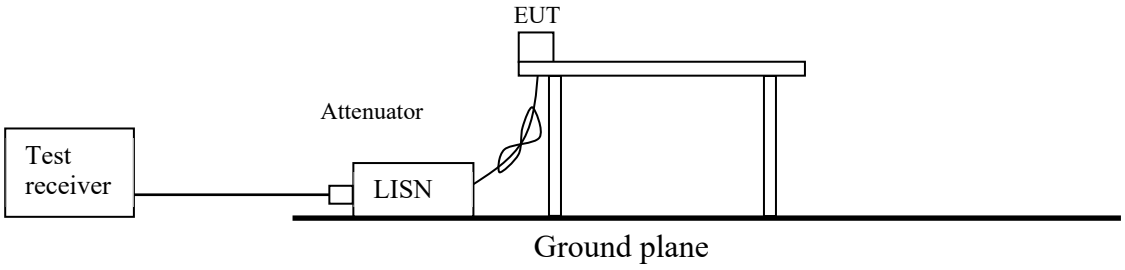
For the tests on EUT with other peripherals (as a whole system)
I/O cables that were connected to the peripherals were bundled in center. They were folded back and forth forming a bundle 30 cm to 40 cm long and were hanged at a 40 cm height to the ground plane. All unused 50 ohm connectors of the LISN (AMN) were resistivity terminated in 50 ohm when not connected to the measuring equipment.

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT in a Semi Anechoic Chamber. The EUT was connected to a LISN (AMN).
An overview sweep with peak detection has been performed.

The test results and limit are rounded off to one decimal place, so some differences might be observed.

Detector **: QP and CISPR Average**
Measurement range **: 0.15 MHz - 30 MHz**
Test data **: APPENDIX**
Test result **: Pass**

Figure 1: Test Setup



SECTION 6: Radiated Spurious Emission and Band Edge Compliance

Test Procedure

< Below 1GHz >
EUT was placed on a urethane platform of nominal size, 0.5 m by 1.0 m, raised 0.8 m above the conducting ground plane.
The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.

< Above 1GHz >
EUT was placed on a urethane platform of nominal size, 0.5 m by 0.5 m, raised 1.5 m above the conducting ground plane.
The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with absorbent materials lined on a ground plane.

The height of the measuring antenna varied between 1 m and 4 m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field strength.
Test antenna was aimed at the EUT for receiving the maximum signal and always kept within the illumination area of the 3 dB beamwidth of the antenna.
The measurements were performed for both vertical and horizontal antenna polarization with the Test Receiver, or the Spectrum Analyzer.
The measurements were made with the following detector function of the test receiver and the Spectrum analyzer (in linear mode).
The test was made with the detector (RBW/VBW) in the following table.
When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

< Below 1GHz >

The result also satisfied with the general limits specified in section 15.209 (a).

< Above 1GHz >

Inside of restricted bands (Section 15.205):

Apply to limit in the Section 15.209 (a).

Outside of the restricted bands:

Apply to limit 68.2 dBuV/m, 3 m (-27 dBm e.i.r.p.*) in the Section 15.407 (b) (1) (2) (3).

For W58 Bandedge
-27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge in the section 15.407(b)(4)(i).

Restricted band edge:

Apply to limit in the Section 15.209 (a).
Since this limit is severer than the limit of the inside of restricted bands.

*Electric field strength to e.i.r.p. conversion:

$$E = \frac{1000000\sqrt{30P}}{3} \quad \text{(uV/m)} \qquad :P \text{ is the e.i.r.p. (Watts)}$$

Test Antennas are used as below;

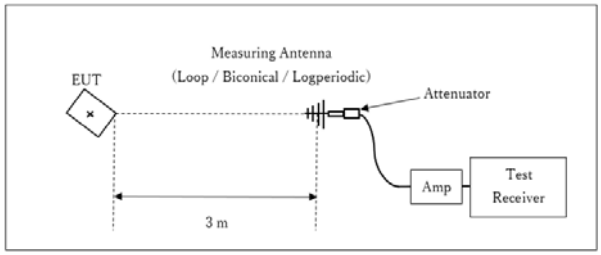
Frequency	30 MHz to 200 MHz	200 MHz to 1 GHz	Above 1 GHz
Antenna Type	Biconical	Logperiodic	Horn

Frequency	Below 1 GHz	Above 1 GHz	
Instrument used	Test Receiver	Spectrum Analyzer	
Detector	QP	Peak	Average
IF Bandwidth	BW: 120 kHz	RBW: 1 MHz VBW: 3 MHz	Method AD *1) RBW: 1 MHz VBW: 3 MHz Detector: Power Averaging (RMS) Trace: ≥ 100 traces If duty cycle was less than 98%, a duty factor was added to the results.

*1) The test method was also referred to KDB 789033 D02 General UNII Test Procedures New Rules v02r01 "Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E".

Figure 2: Test Setup

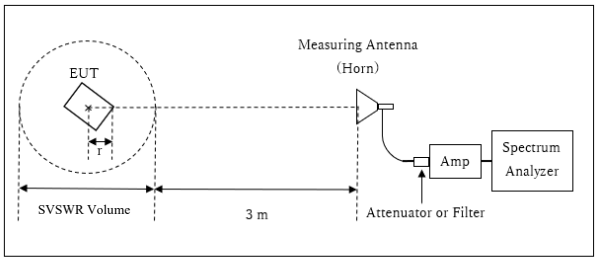
Below 1 GHz



× : Center of turn table

Test Distance: 3 m

1 GHz - 10 GHz

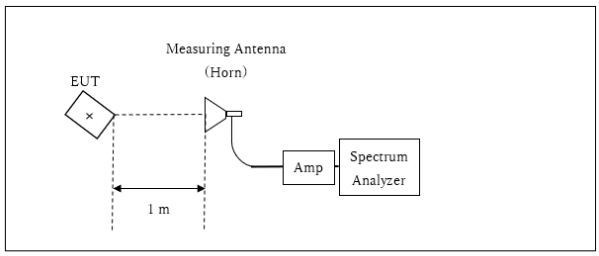


r : Radius of an outer periphery of EUT
× : Center of turn table

Distance Factor: 20 x log (3.95 m / 3.0 m) = 2.39 dB
* Test Distance: (3 + SVSWR Volume /2) - r = 3.95 m

SVSWR Volume : 2.0 m
(SVSWR Volume has been calibrated based on CISPR 16-1-4.)
r = 0.05m

10 GHz - 40 GHz



× : Center of turn table

Distance Factor: 20 x log (1.0 m / 3.0 m) = -9.5 dB
*Test Distance: 1 m

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

The test results and limit are rounded off to one decimal place, so some differences might be observed.

Measurement range : 30 MHz - 40 GHz
Test data : APPENDIX
Test result : Pass

SECTION 7: Antenna Terminal Conducted Tests

Test Procedure

The tests were made with below setting connected to the antenna port.

Test	Span	RBW	VBW	Sweep time	Detector	Trace	Instrument used and Test method
26 dB Bandwidth	Enough to capture the emission	Close to 1 % of EBW	> RBW	Auto	Peak	Max Hold	Spectrum Analyzer
99 % Occupied Bandwidth *1)	Enough width to display emission skirts	1 % to 5 % of OBW	≥ 3 RBW	Auto	Peak	Max Hold	Spectrum Analyzer
6 dB Bandwidth	Enough to capture the emission	100 kHz	300 kHz	Auto	Peak	Max Hold	Spectrum Analyzer
Maximum Conducted Output Power	-	-	-	Auto	Average	-	Power Meter (Sensor: 80 MHz BW) (Method PM)
Maximum Power Spectral Density	Encompass the entire EBW	1 MHz or 470 kHz *2)	≥ 3 RBW	Auto	RMS or Sample Power Averaging (200 times)	Clear Write	Spectrum Analyzer
Conducted Spurious Emission*3) *4)	9 kHz – 150 kHz	200 Hz	620 Hz	Auto	Peak	Max Hold	Spectrum Analyzer
	150 kHz – 30 MHz	9.1 kHz	27 kHz				

* The test method was also referred to KDB 789033 D02 General UNII Test Procedures New Rules v02r01 "Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E".

*1) Peak hold was applied as Worst-case measurement.
*2) KDB 789033 D02 says that RBW is set to be 500 kHz for 5.725 GHz-5.850 GHz, but it is not possible with spectrum analyzer, so RBW Correction Factor (10 log(500 kHz / 470 kHz)) was added to the test result.
*3) In the frequency range below 30 MHz, RBW was narrowed to separate the noise contents. Then, wide-band noise near the limit was checked separately, however the noise was not detected as shown in the chart. (9 kHz-150 kHz: RBW = 200 Hz, 150 kHz-30 MHz: RBW = 9.1 kHz)
*4) The limits in CFR 47, Part 15, Subpart C, paragraph 15.209(a), are identical to those in RSS-Gen section 8.9, Table 6, since the measurements are performed in terms of magnetic field strength and converted to electric field strength levels (as reported in the table) using the free space impedance of 377 Ohmes. For example, the measurement at frequency 9 kHz resulted in a level of 45.5 dBuV/m, which is equivalent to 45.5 – 51.5 = -6.0 dBuA/m, which has the same margin, 3 dB, to the corresponding RSS-Gen Table 6 limit as it has to 15.209(a) limit.

The test results and limit are rounded off to two decimals place, so some differences might be observed.
The equipment and cables were not used for factor 0 dB of the data sheets.

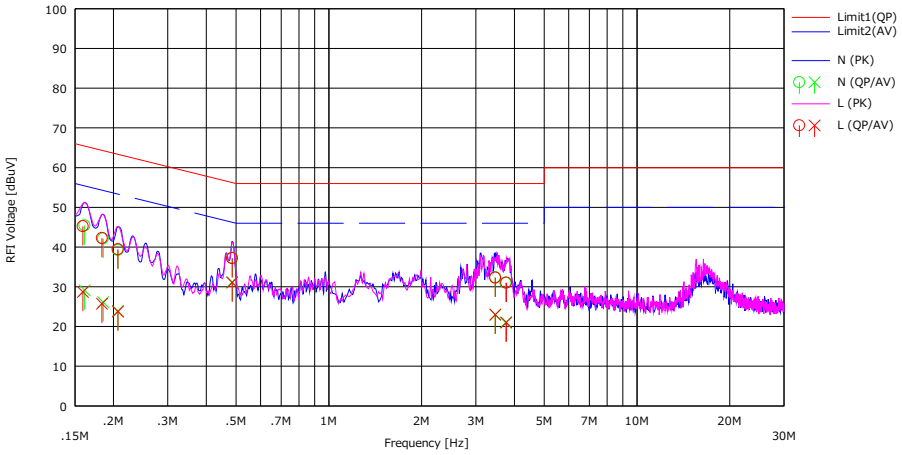
Test data : APPENDIX
Test result : Pass

APPENDIX 1: Test data

Conducted Emission

Report No.	13395143H
Test place	Ise EMC Lab. No.2 Measurement Room
Date	June 14, 2020
Temperature / Humidity	22 deg. C / 70 % RH
Engineer	Akihiko Maeda
Mode	Tx 11ac-20 5580MHz

Limit : FCC_Part 15 Subpart C(15.207)



No.	Freq.	Reading ⟨QP⟩	Reading ⟨AV⟩	LISN	LOSS	Results ⟨QP⟩	Results ⟨AV⟩	Limit ⟨QP⟩	Limit ⟨AV⟩	Margin ⟨QP⟩	Margin ⟨AV⟩	Phase	Comment
	[MHz]	[dBuV]	[dBuV]	[dB]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	0.16123	32.20	15.90	0.07	13.15	45.42	29.12	65.40	55.40	19.98	26.28	N	
2	0.18516	28.90	12.90	0.07	13.16	42.13	26.13	64.30	54.30	22.17	28.17	N	
3	0.20676	26.00	10.70	0.07	13.16	39.23	23.93	63.30	53.30	24.07	29.37	N	
4	0.48580	24.00	17.90	0.08	13.22	37.30	31.20	56.20	46.20	18.90	15.00	N	
5	3.46928	18.70	9.30	0.12	13.55	32.37	22.97	56.00	46.00	23.63	23.03	N	
6	3.74508	17.30	7.30	0.12	13.57	30.99	20.99	56.00	46.00	25.01	25.01	N	
7	0.15924	32.00	15.50	0.07	13.15	45.22	28.72	65.50	55.50	20.28	26.78	L	
8	0.18364	29.00	12.50	0.07	13.16	42.23	25.73	64.30	54.30	22.07	28.57	L	
9	0.20688	26.20	10.50	0.07	13.16	39.43	23.73	63.30	53.30	23.87	29.57	L	
10	0.48556	23.90	17.80	0.05	13.22	37.17	31.07	56.20	46.20	19.03	15.13	L	
11	3.46936	18.60	9.30	0.13	13.55	32.28	22.98	56.00	46.00	23.72	23.02	L	
12	3.76768	17.30	7.30	0.13	13.57	31.00	21.00	56.00	46.00	25.00	25.00	L	

CHART: WITH FACTOR Peak hold data. CALCULATION : RESULT = READING + C.F (LISN + CABLE + ATT)
Except for the above table: adequate margin data below the limits.

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Report No.	13395143H
Test place	Ise EMC Lab. No.3 Measurement Room
Date	June 12, 2020
Temperature / Humidity	22 deg. C / 65 % RH
Engineer	Junki Nagatomi
Mode	Tx

11a

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Antenna 1	5280	20.743	16974.4
	5300	20.814	16967.1
	5320	20.691	16931.6
	5500	20.711	16964.9
	5580	20.847	16952.5
	5700	20.609	16985.0
	5720	20.639	16956.2
	5745	-	16994.0
	5785	-	16926.7
	5825	-	16946.7

11n-20

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Antenna 1	5280	20.929	17998.5
	5300	20.453	18004.3
	5320	20.923	17964.4
	5500	20.607	18024.7
	5580	21.003	18029.2
	5700	20.964	18042.1
	5720	20.657	17973.3
	5745	-	17978.2
	5785	-	17979.8
	5825	-	18091.8

11ac-20

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Antenna 1	5280	20.880	17999.2
	5300	20.992	18024.7
	5320	20.928	18016.8
	5500	21.018	17999.6
	5580	21.053	18095.1
	5700	21.058	18062.3
	5720	20.719	18042.3
	5745	-	18071.4
	5785	-	18064.1
	5825	-	18044.0

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Report No.	13395143H
Test place	Ise EMC Lab. No.3 Measurement Room
Date	June 12, 2020
Temperature / Humidity	22 deg. C / 65 % RH
Engineer	Junki Nagatomi
Mode	Tx

11n-40

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Antenna 1	5310	39.549	36374.3
	5510	39.491	36421.6
	5550	39.510	36386.1
	5670	39.174	36339.0
	5710	39.355	36341.2
	5755	-	36415.8
	5795	-	36439.9

11ac-40

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Antenna 1	5310	39.261	36231.9
	5510	39.457	36283.7
	5550	39.386	36278.3
	5670	39.131	36304.3
	5710	39.181	36203.2
	5755	-	36260.1
	5795	-	36311.7

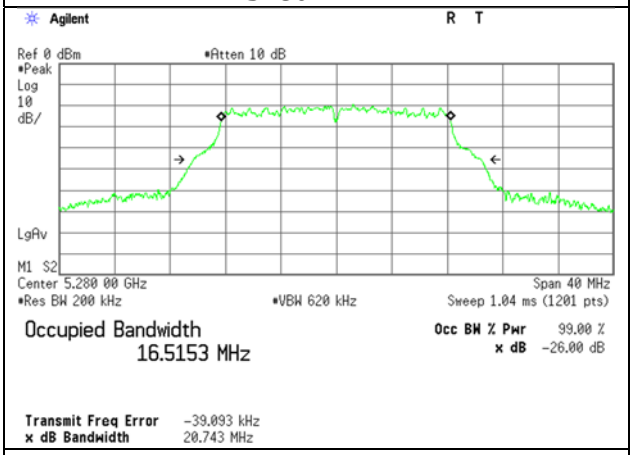
11ac-80

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Antenna 1	5530	80.627	75769.3
	5690	80.952	75824.1
	5775	-	75931.5

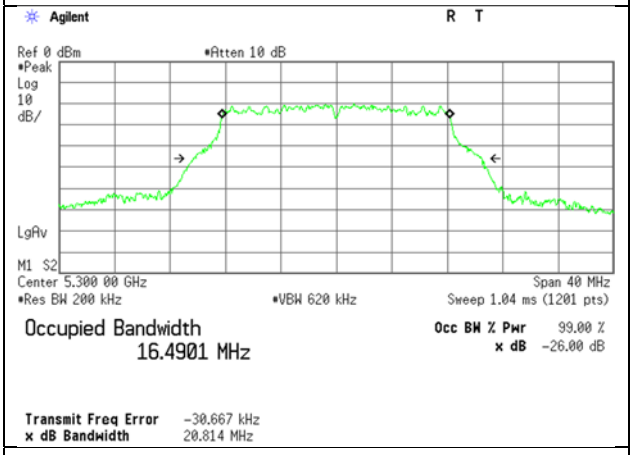
26 dB Emission Bandwidth

11a, Antenna 1

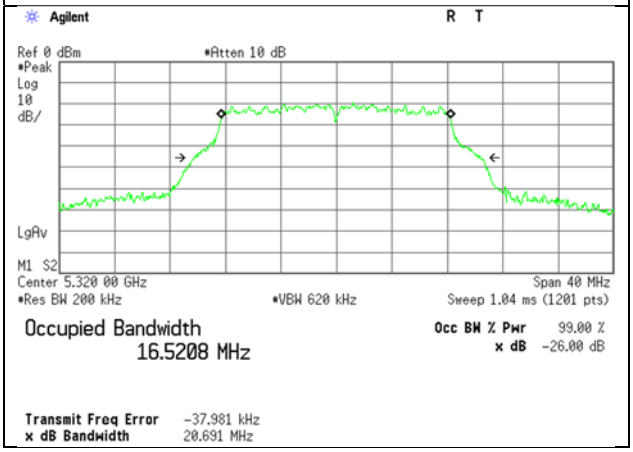
5280 MHz



5300 MHz



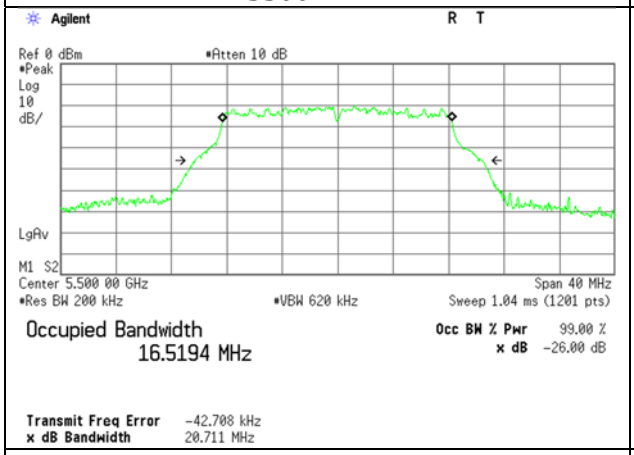
5320 MHz



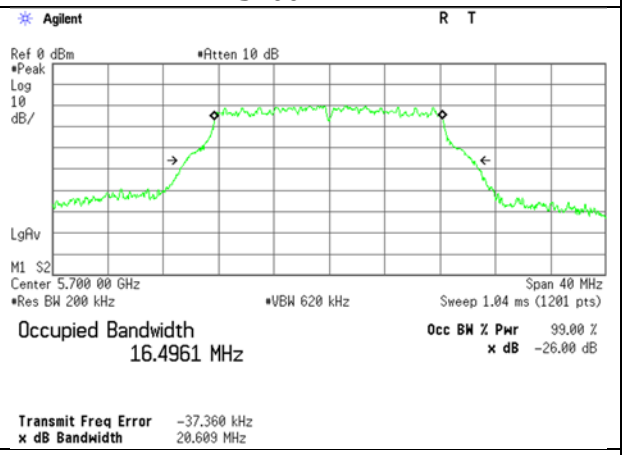
26 dB Emission Bandwidth

11a, Antenna 1

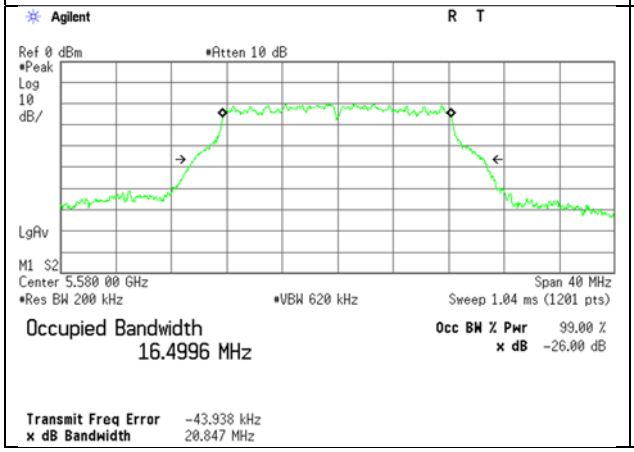
5500 MHz



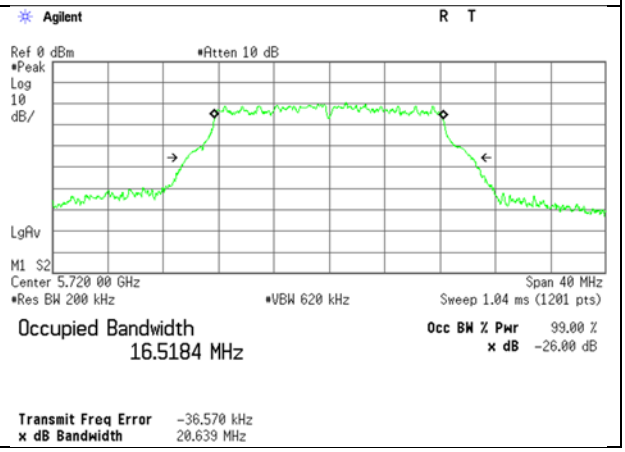
5700 MHz



5580 MHz



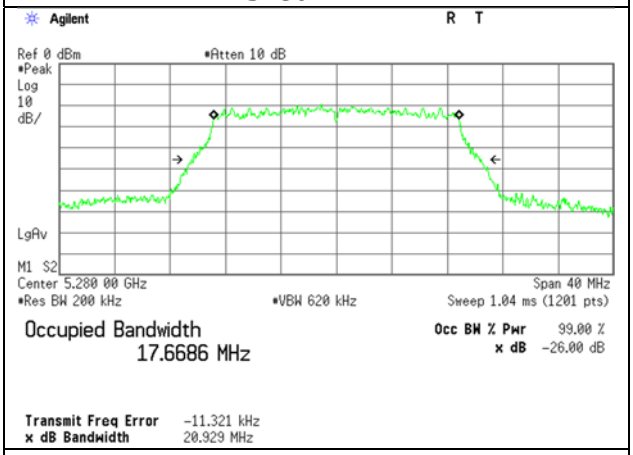
5720 MHz



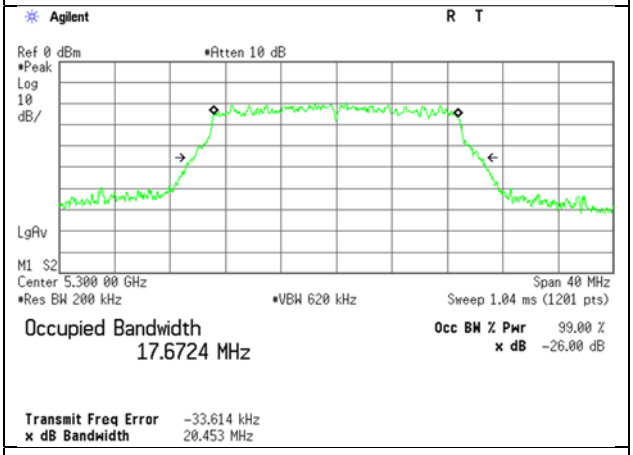
26 dB Emission Bandwidth

11n-20, Antenna 1

5280 MHz



5300 MHz



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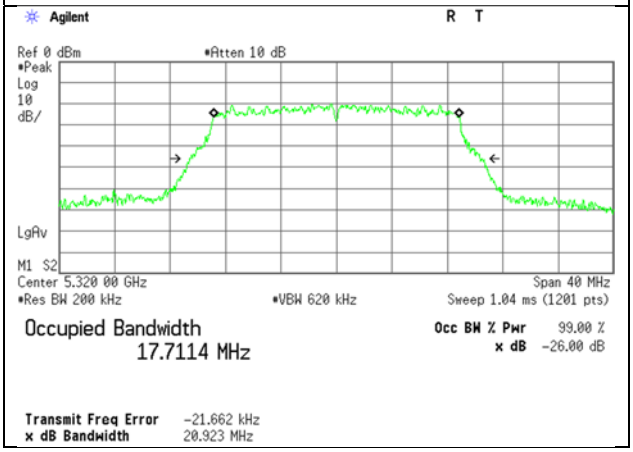
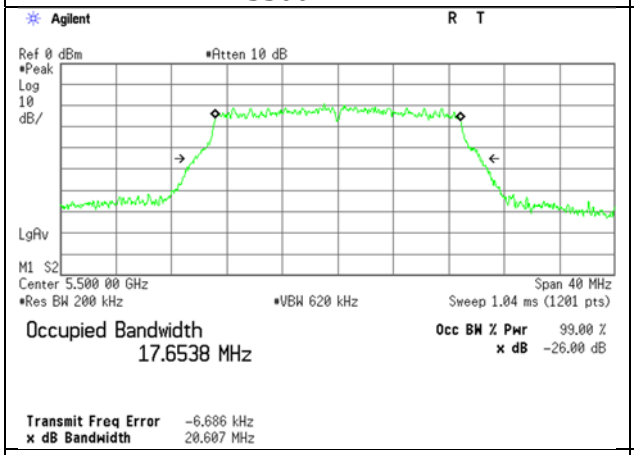


26 dB Emission Bandwidth

11n-20, Antenna 1

5500 MHz



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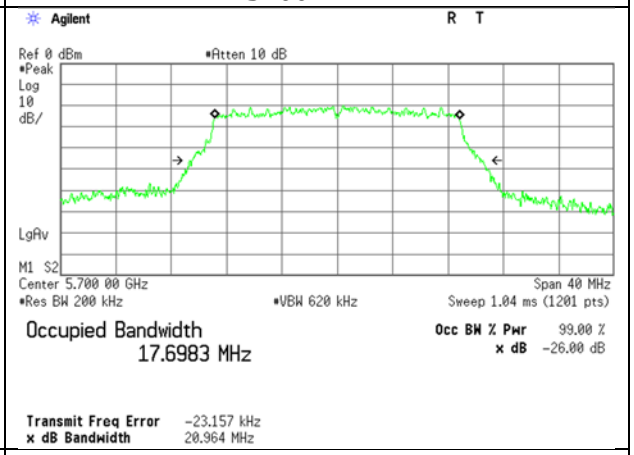
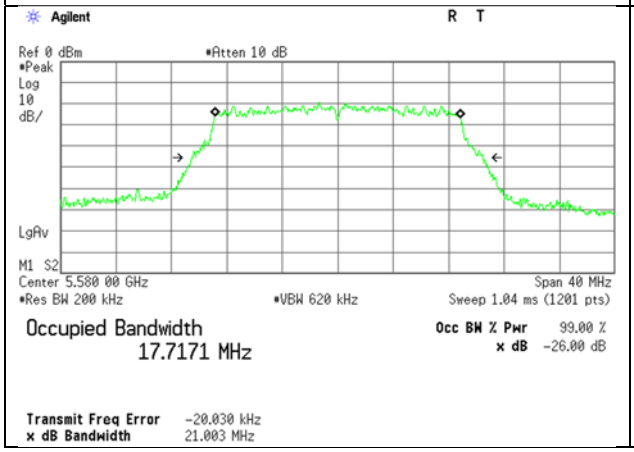


5580 MHz



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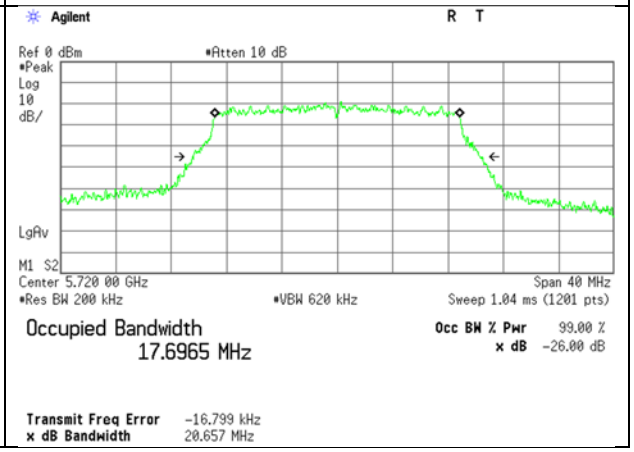
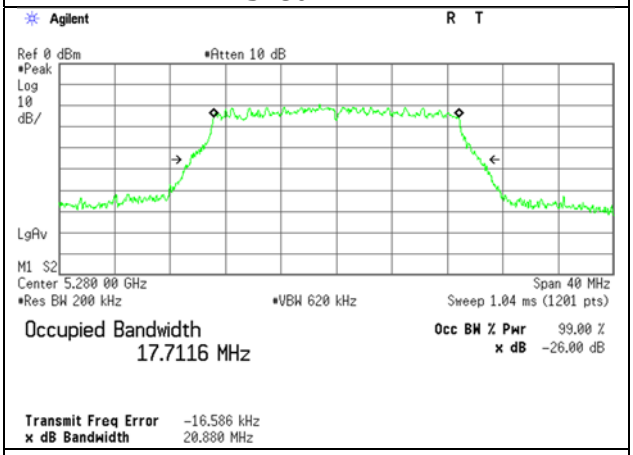


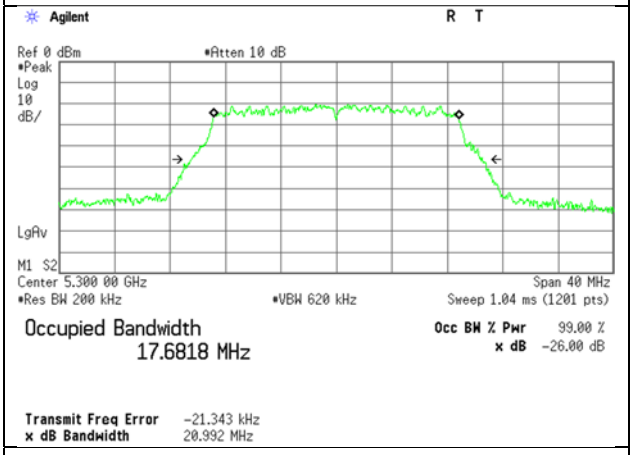
26 dB Emission Bandwidth

11ac-20, Antenna 1

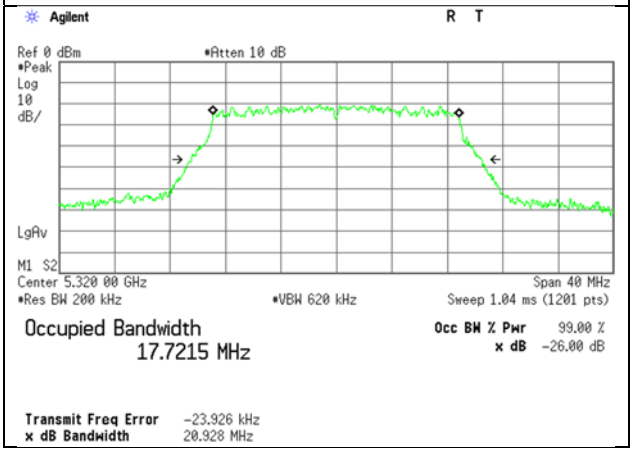
5280 MHz



5300 MHz



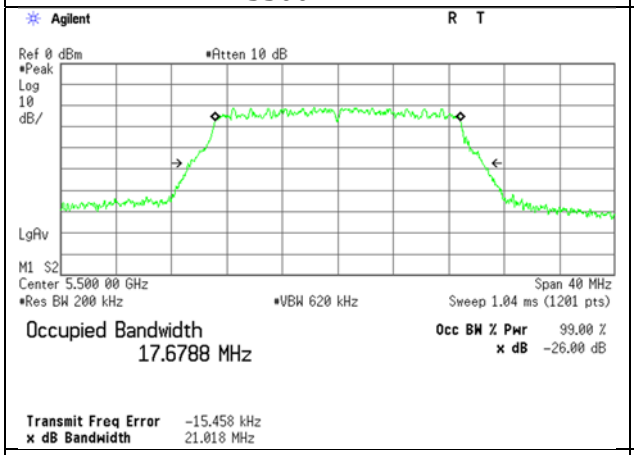
5320 MHz



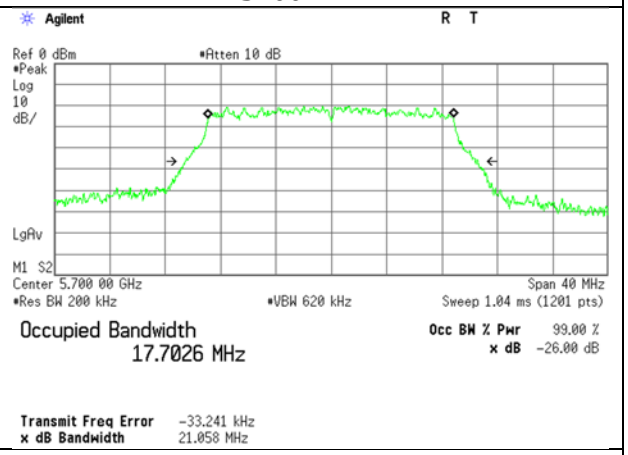
26 dB Emission Bandwidth

11ac, Antenna 1

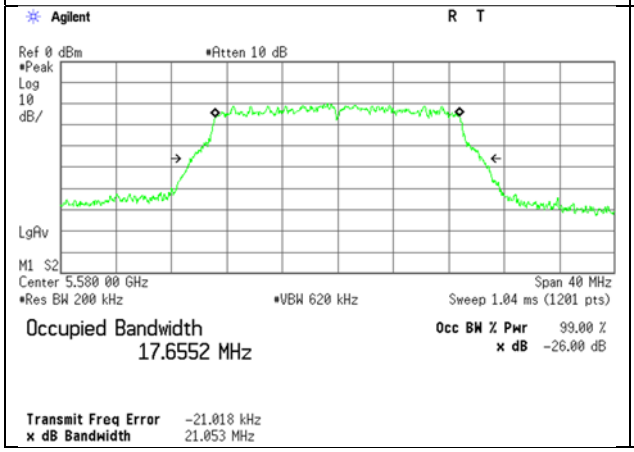
5500 MHz



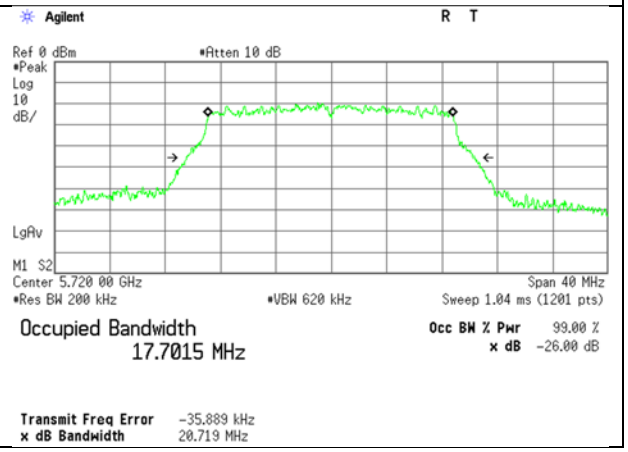
5700 MHz



5580 MHz



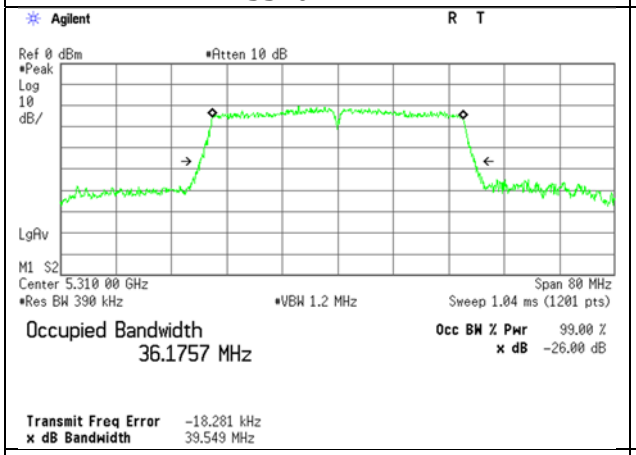
5720 MHz



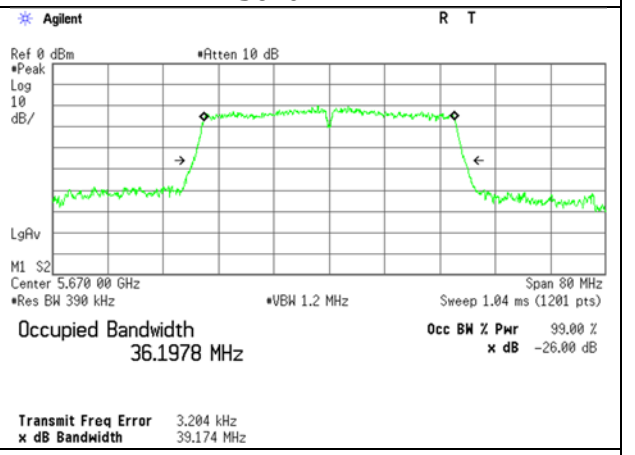
26 dB Emission Bandwidth

11n-40, Antenna 1

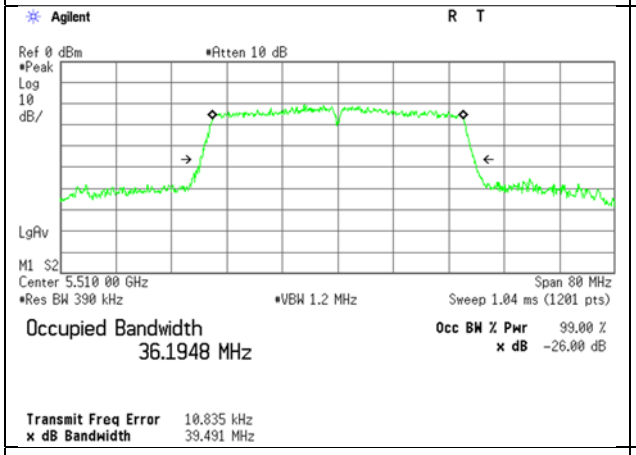
5310 MHz



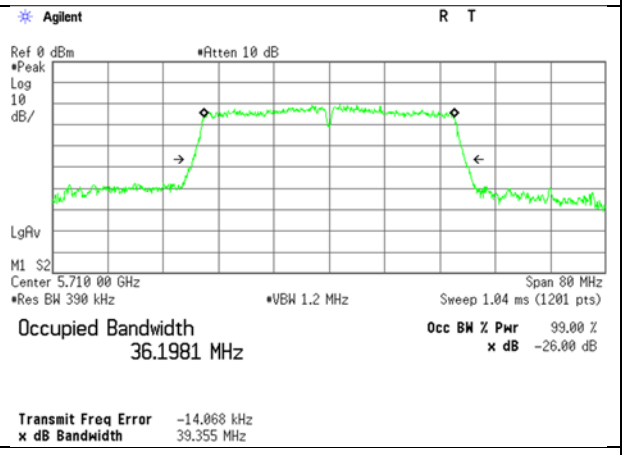
5670 MHz



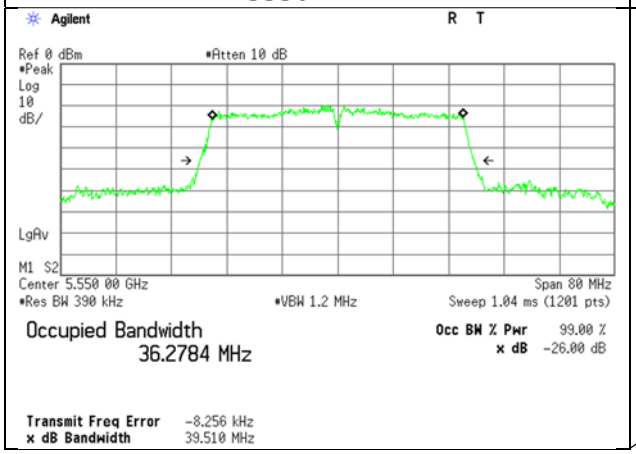
5510 MHz



5710 MHz



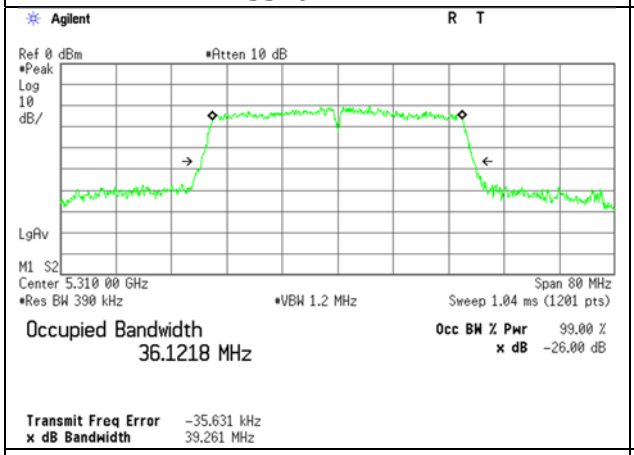
5550 MHz



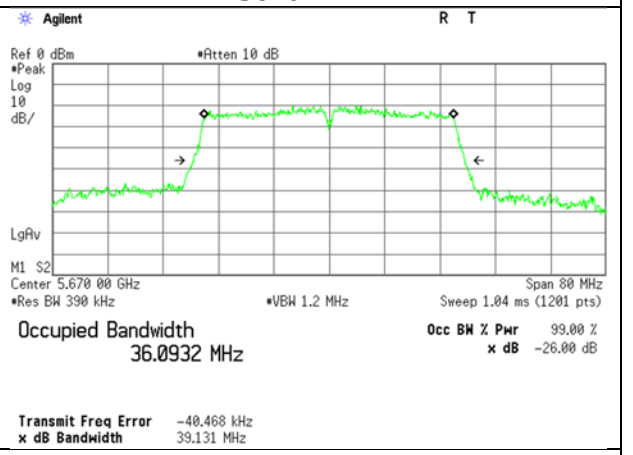
26 dB Emission Bandwidth

11ac-40, Antenna 1

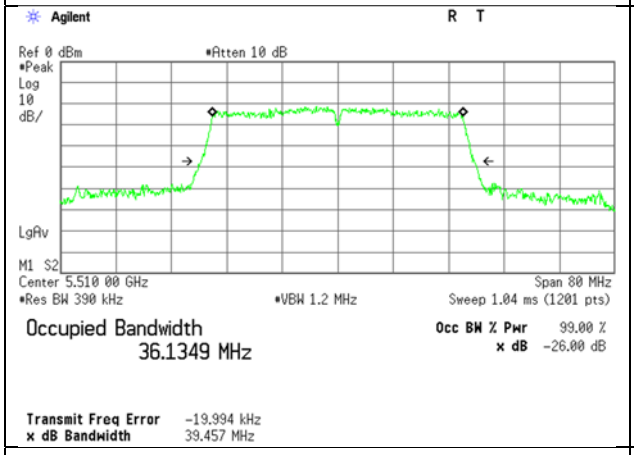
5310 MHz



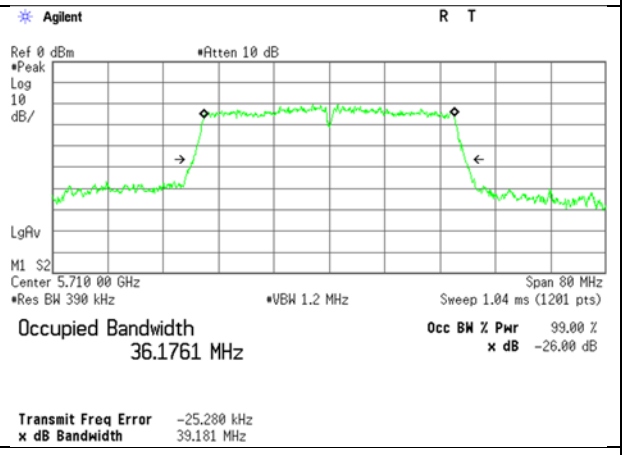
5670 MHz



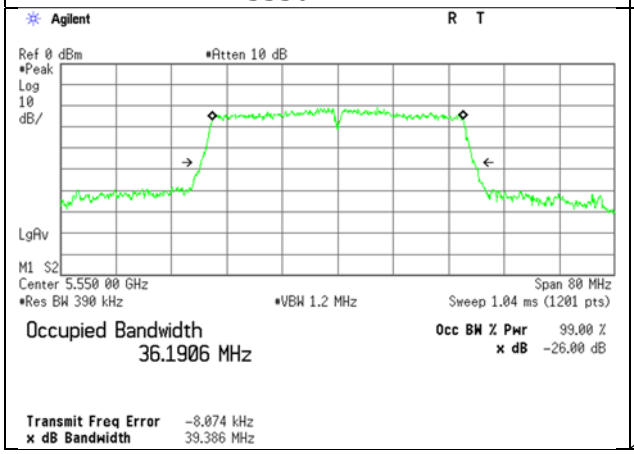
5510 MHz



5710 MHz



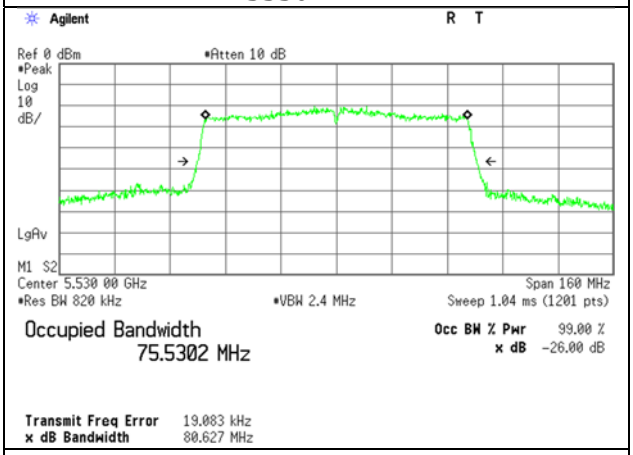
5550 MHz



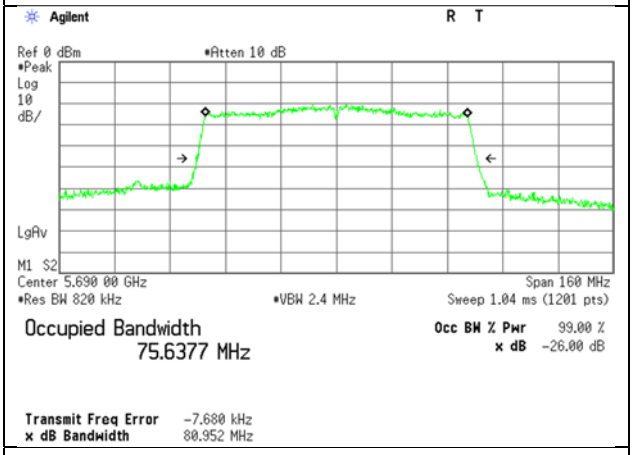
26 dB Emission Bandwidth

11ac-80, Antenna 1

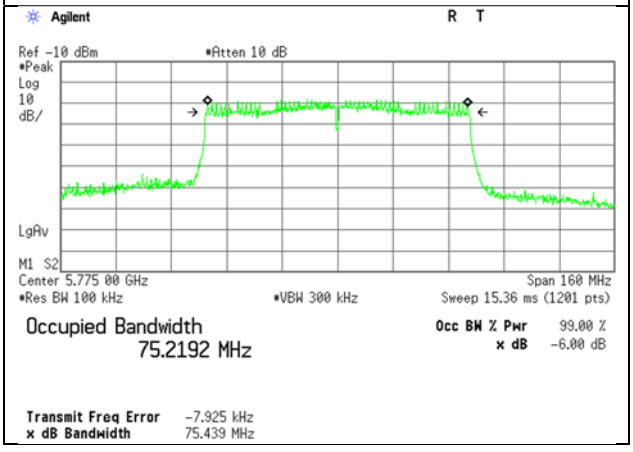
5530 MHz



5610 MHz



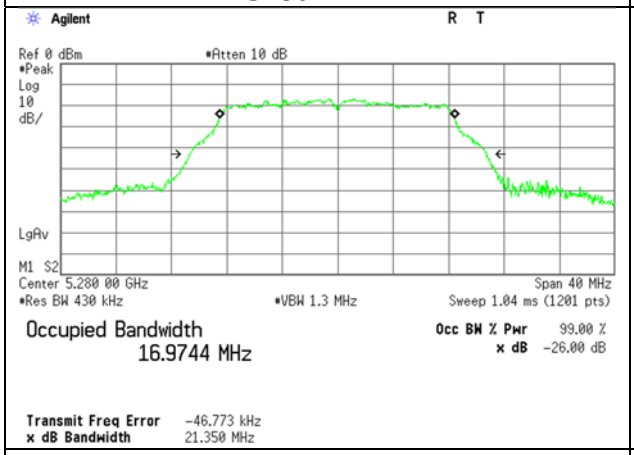
5775 MHz



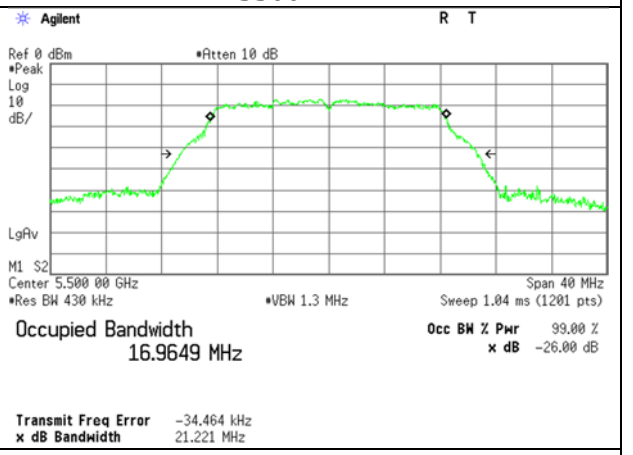
99 % Occupied Bandwidth

11a, Antenna 1

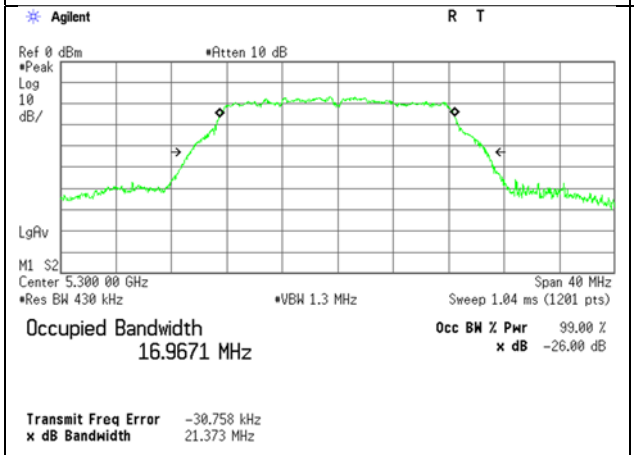
5280 MHz



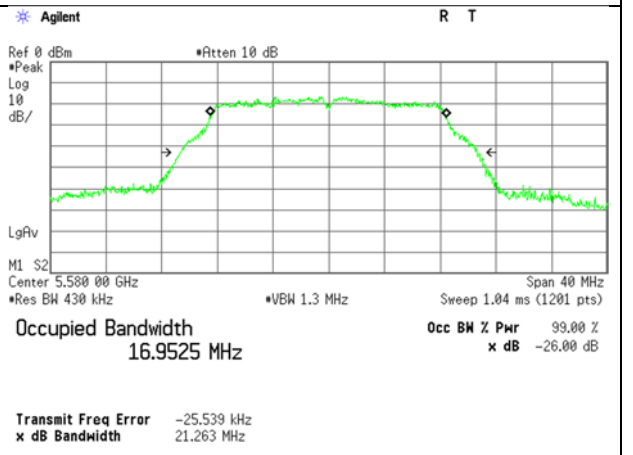
5500 MHz



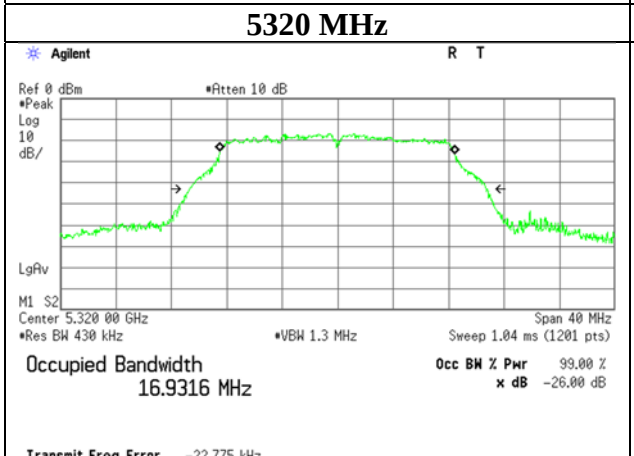
5300 MHz



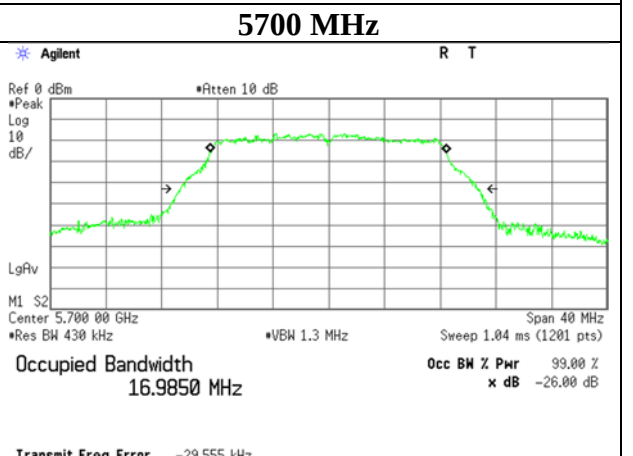
5580 MHz



5320 MHz



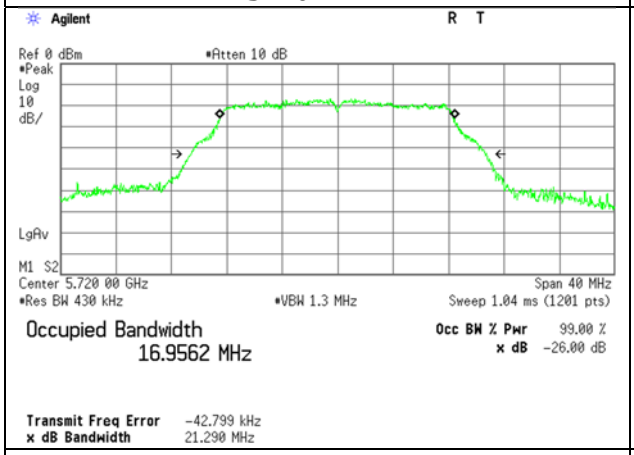
5700 MHz



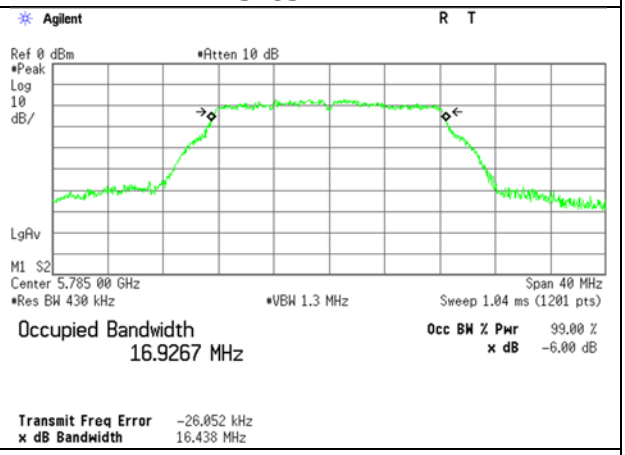
99 % Occupied Bandwidth

11a, Antenna 1

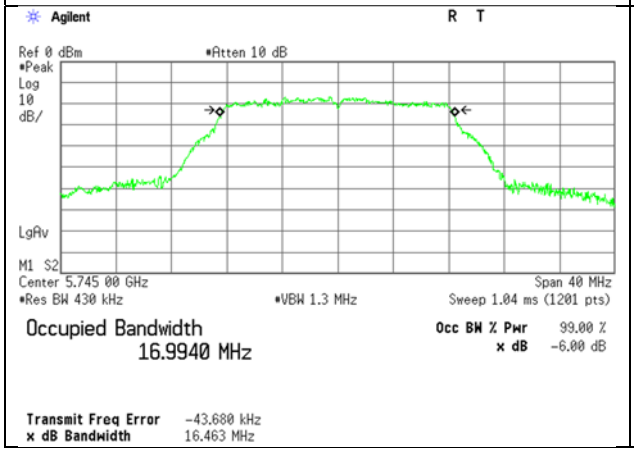
5720 MHz



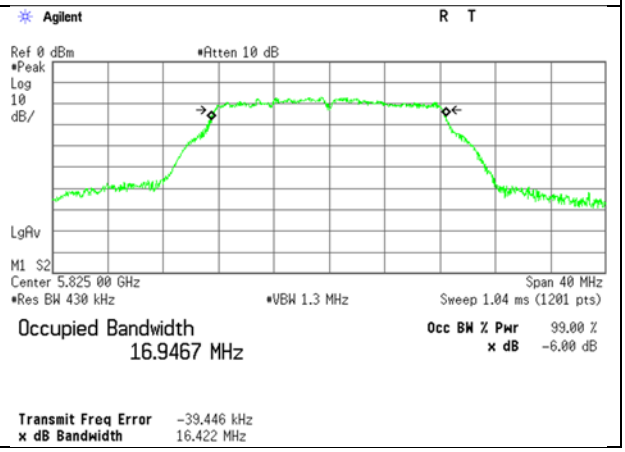
5785 MHz



5745 MHz



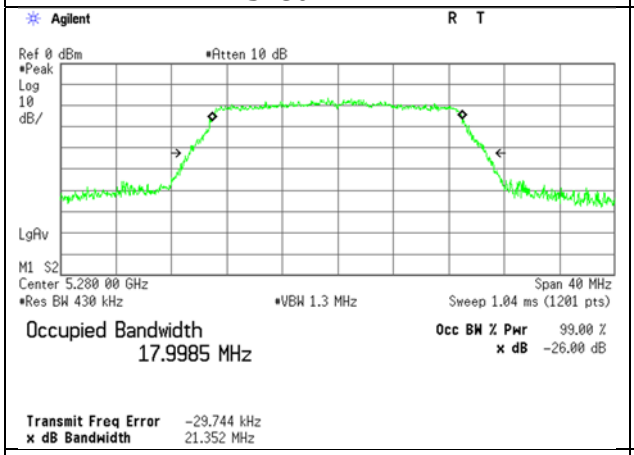
5825 MHz



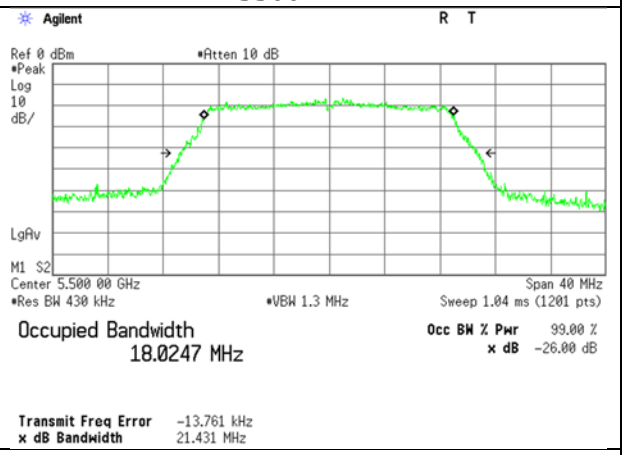
99 % Occupied Bandwidth

11n-20, Antenna 1

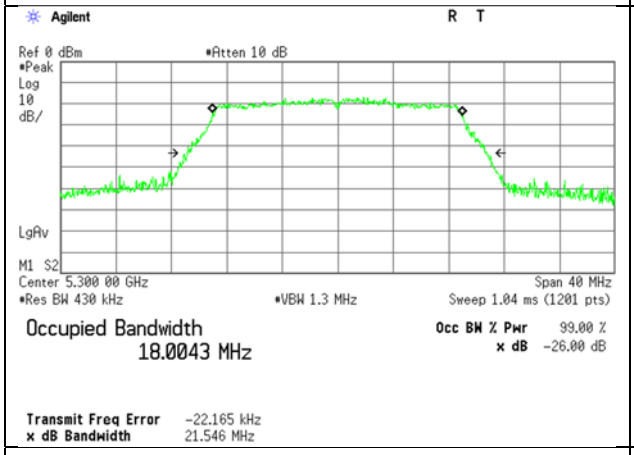
5280 MHz



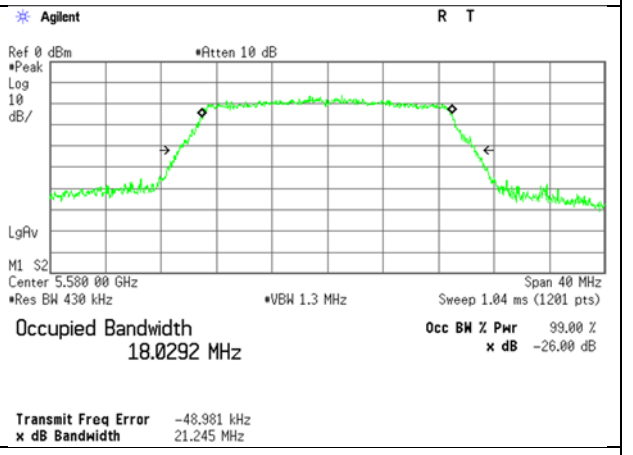
5500 MHz



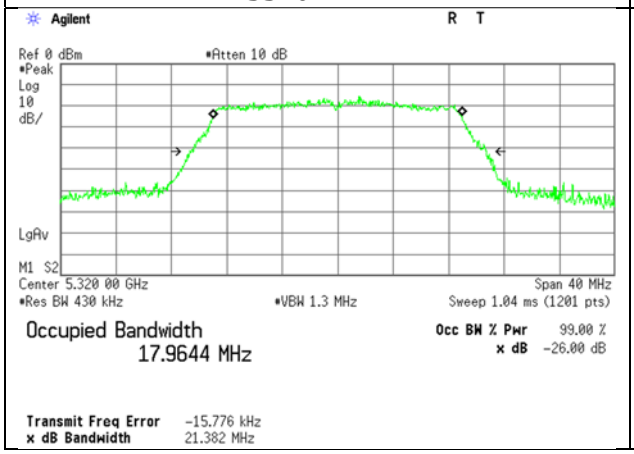
5300 MHz



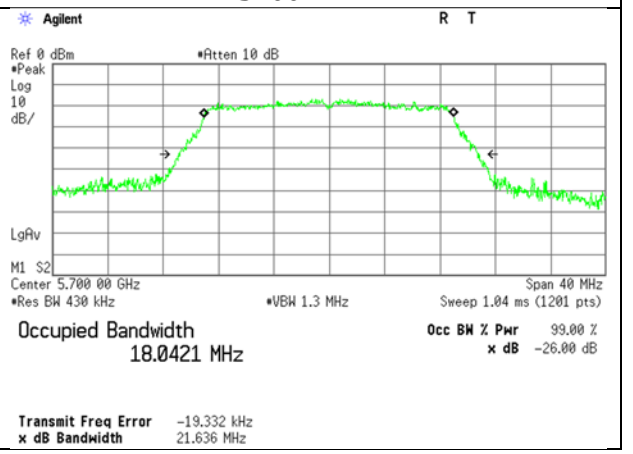
5580 MHz



5320 MHz



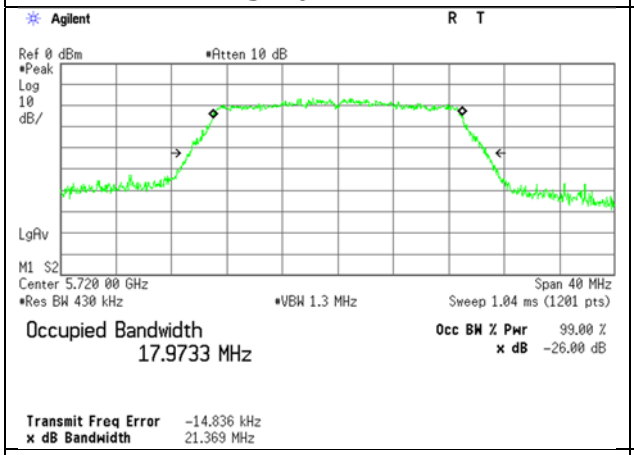
5700 MHz



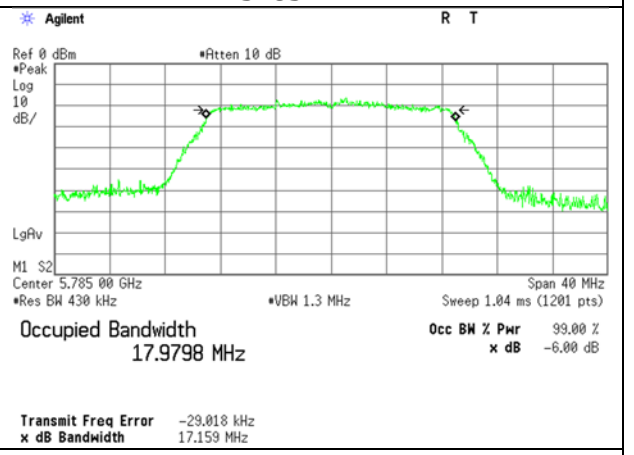
99 % Occupied Bandwidth

11n-20, Antenna 1

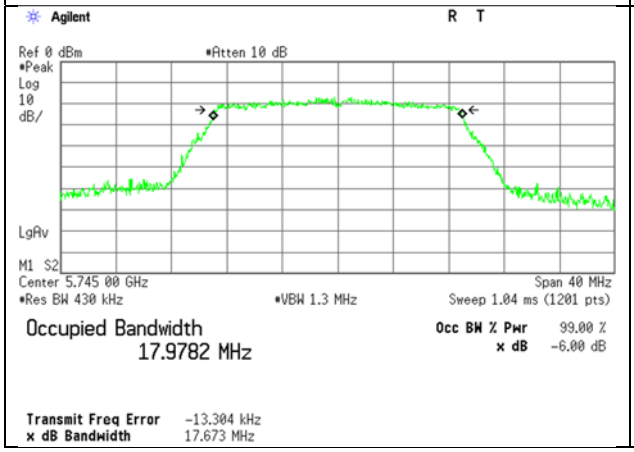
5720 MHz



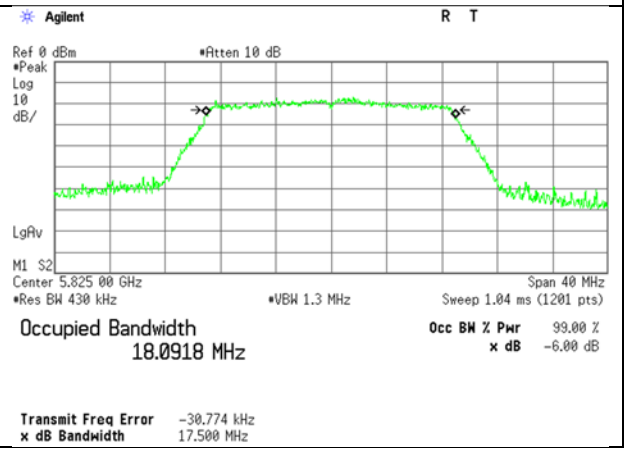
5785 MHz



5745 MHz



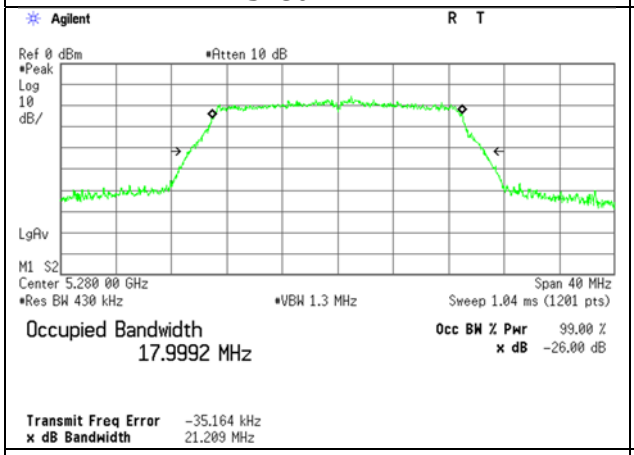
5825 MHz



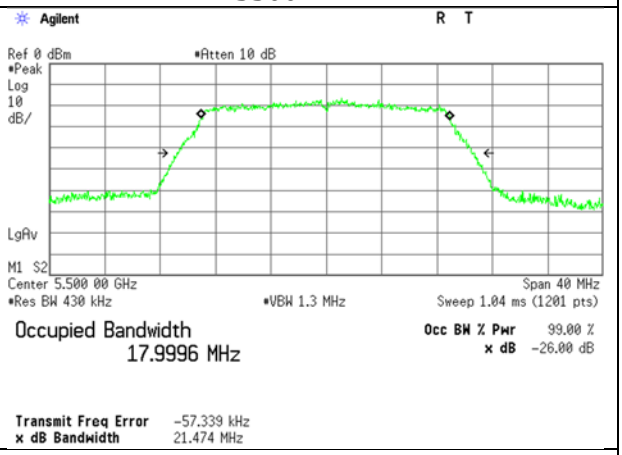
99 % Occupied Bandwidth

11ac-20, Antenna 1

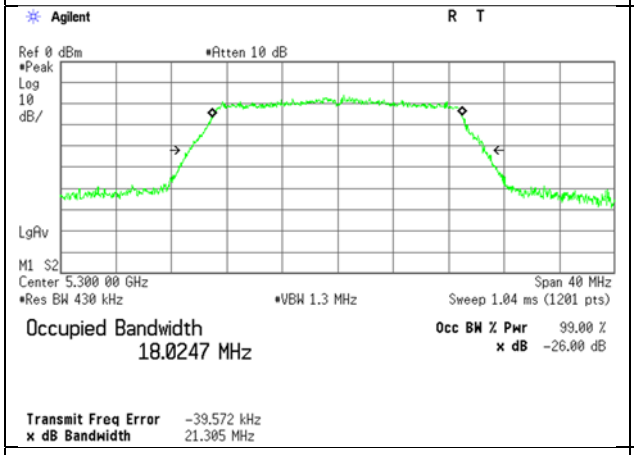
5280 MHz



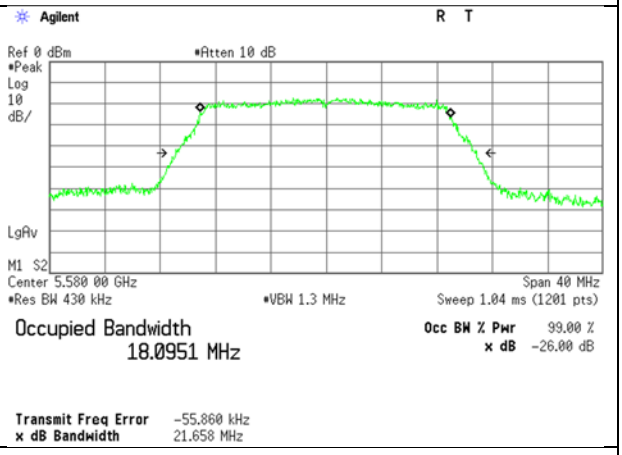
5500 MHz



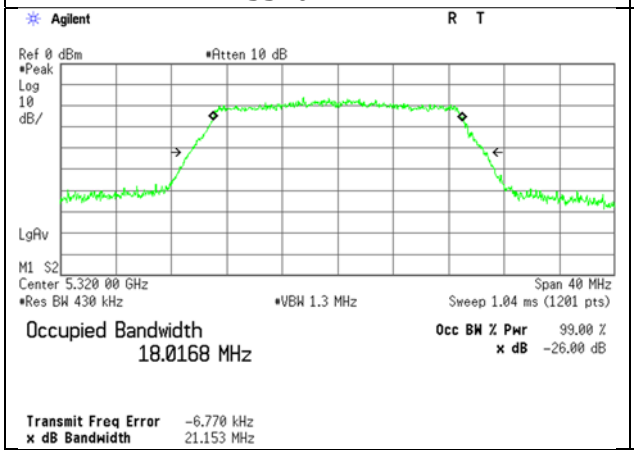
5300 MHz



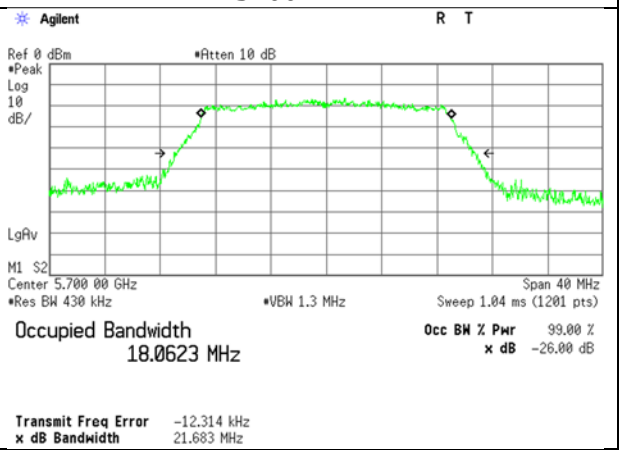
5580 MHz



5320 MHz



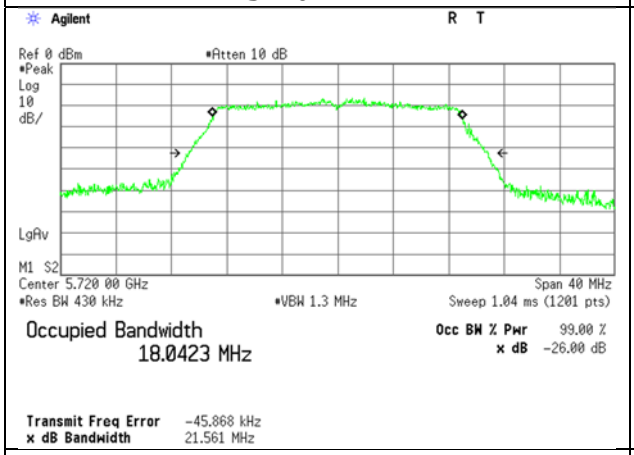
5700 MHz



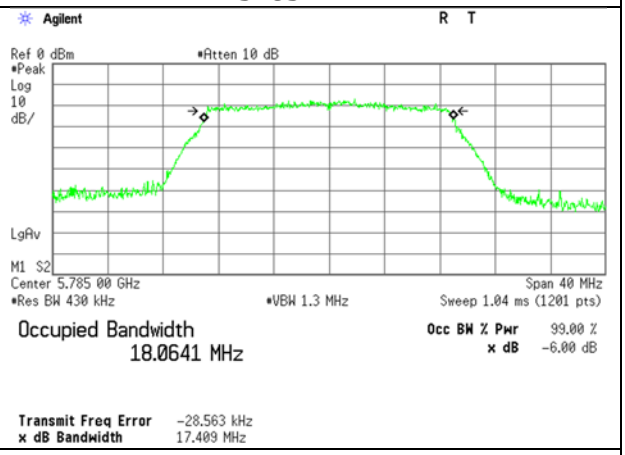
99 % Occupied Bandwidth

11ac-20, Antenna 1

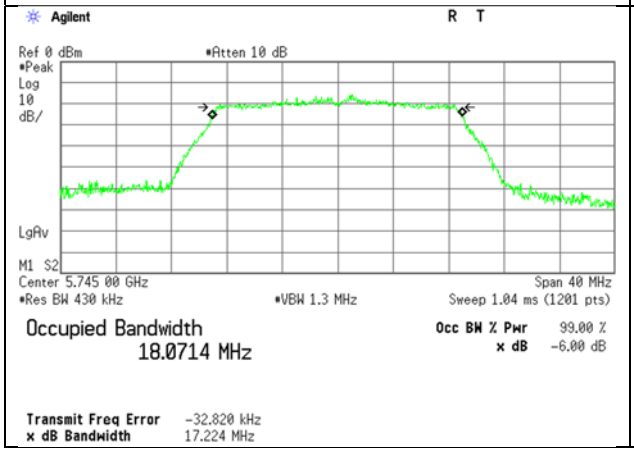
5720 MHz



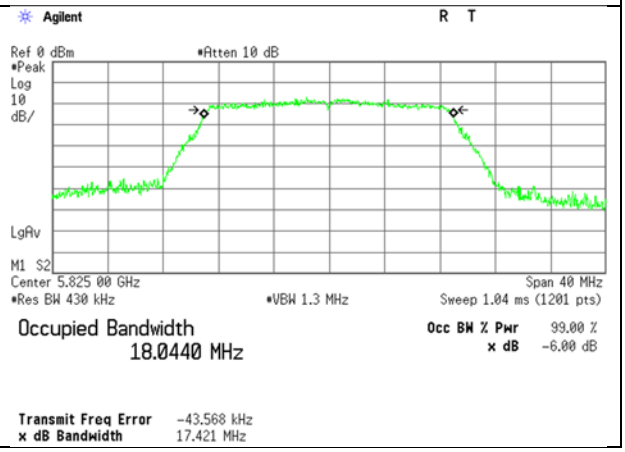
5785 MHz



5745 MHz



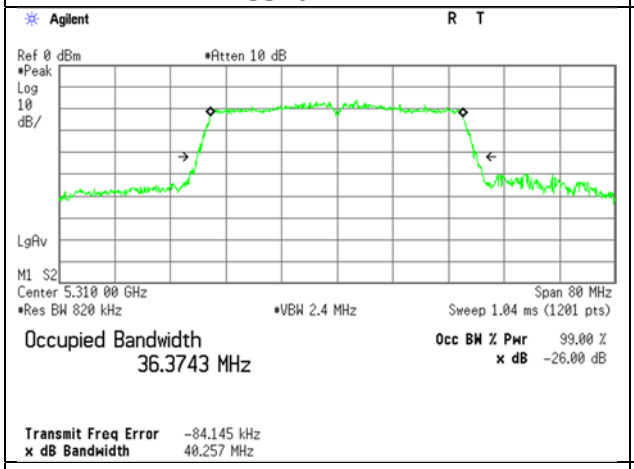
5825 MHz



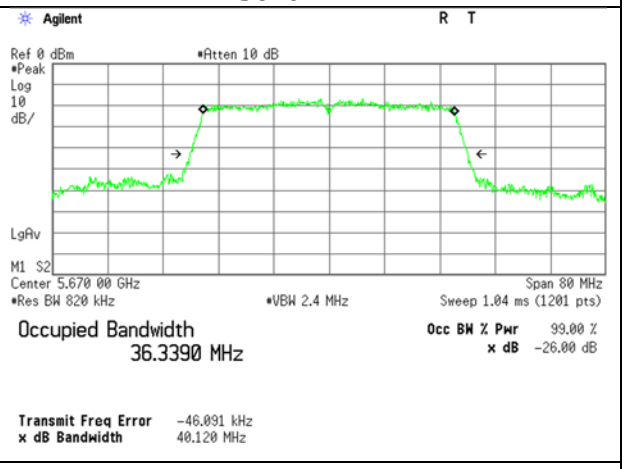
99 % Occupied Bandwidth

11n-40, Antenna 1

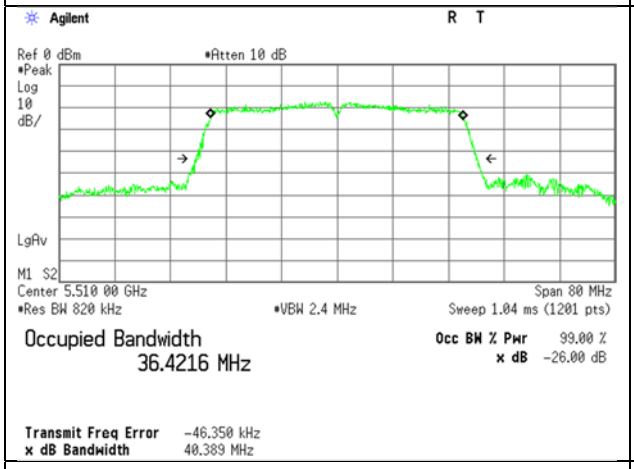
5310 MHz



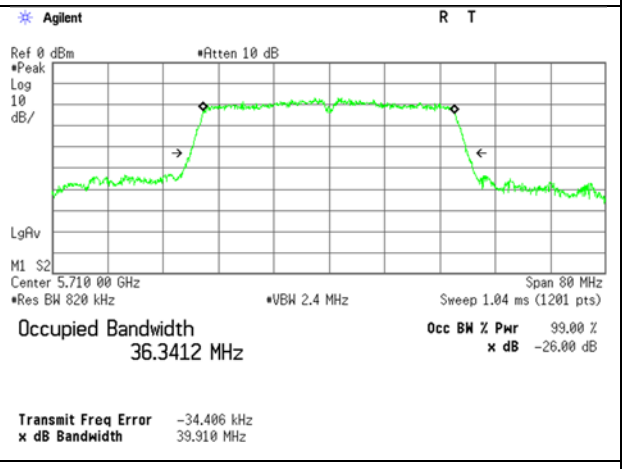
5670 MHz



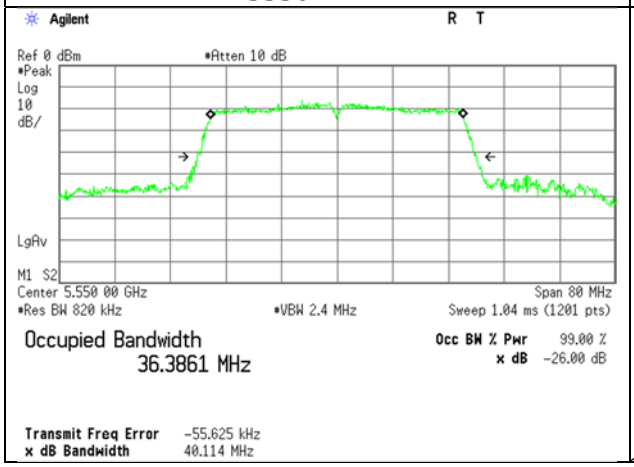
5510 MHz



5710 MHz

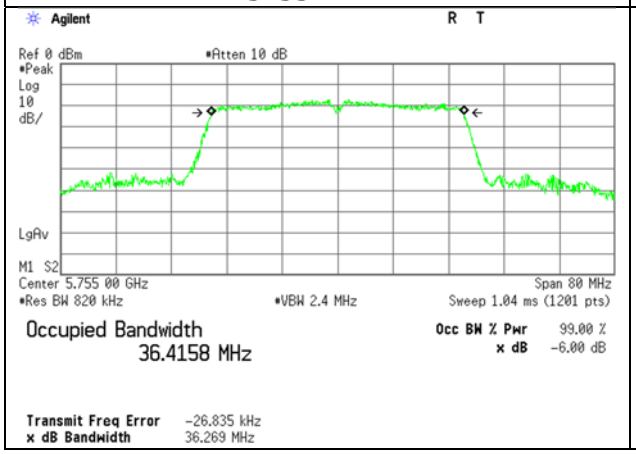
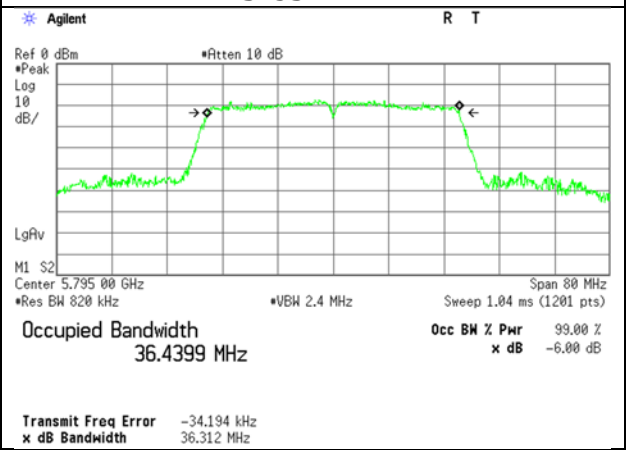


5550 MHz



99 % Occupied Bandwidth

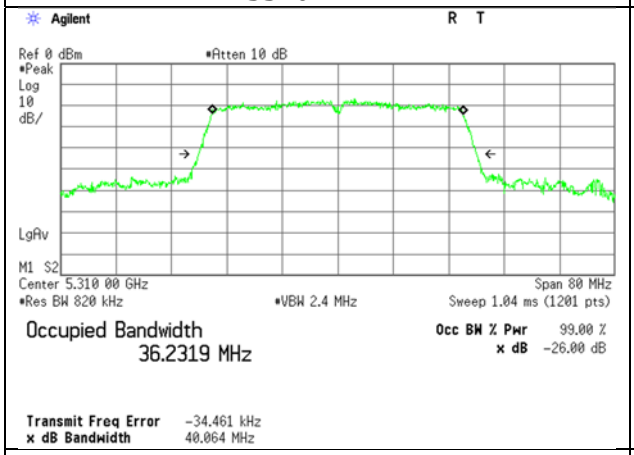
11n-40, Antenna 1

5755 MHz	5795 MHz
	

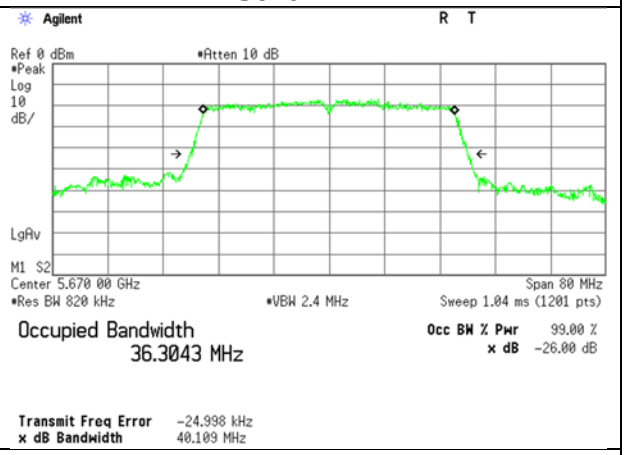
99 % Occupied Bandwidth

11ac-40, Antenna 1

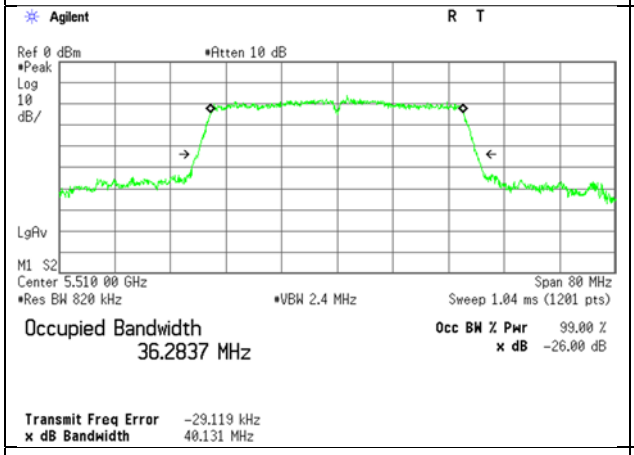
5310 MHz



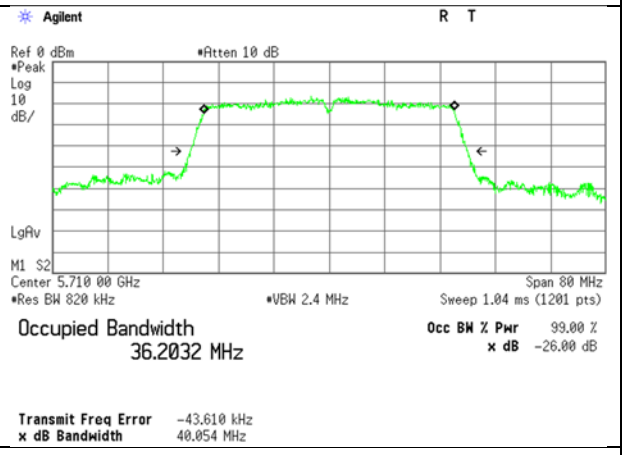
5670 MHz



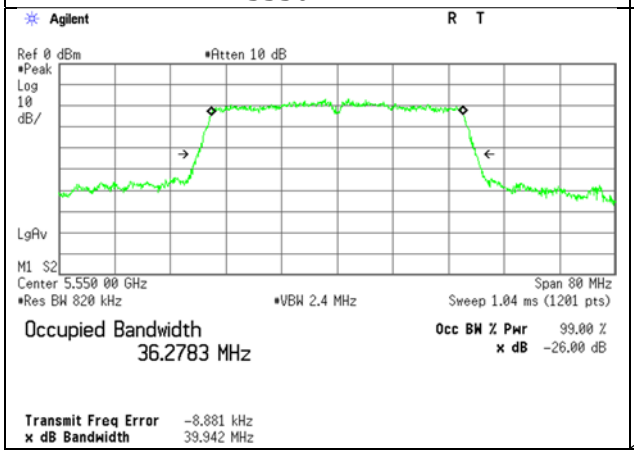
5510 MHz



5710 MHz

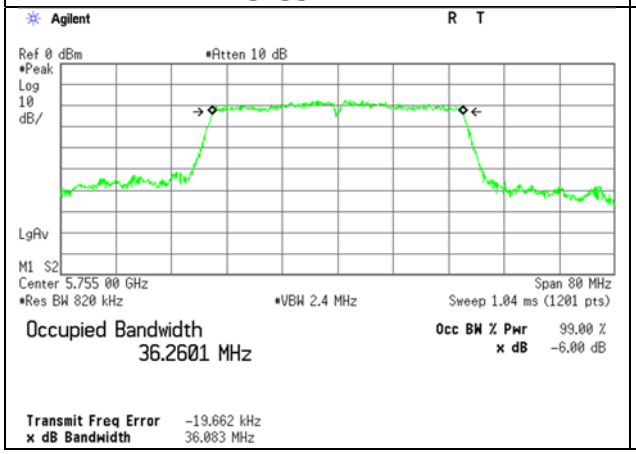
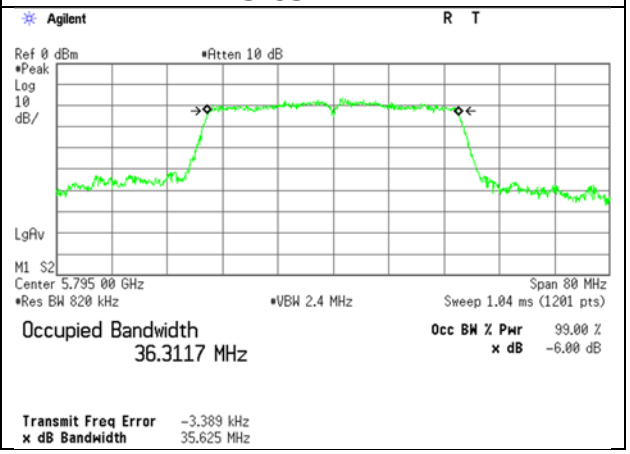


5550 MHz



99 % Occupied Bandwidth

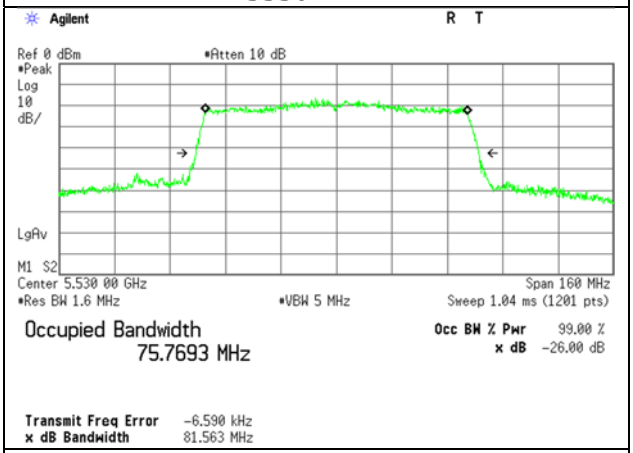
11ac-40, Antenna 1

5755 MHz	5795 MHz
	

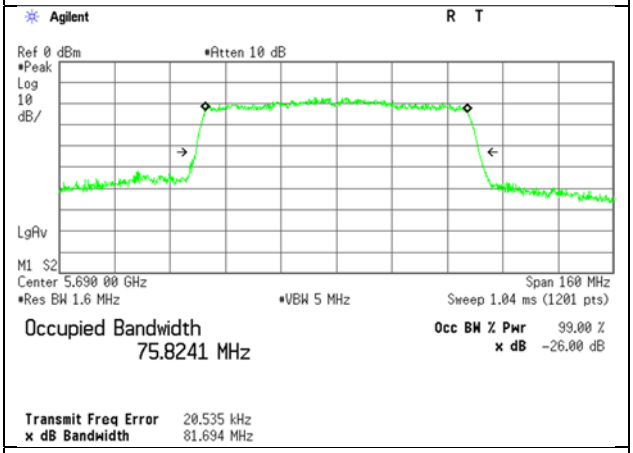
99 % Occupied Bandwidth

11ac-80, Antenna 1

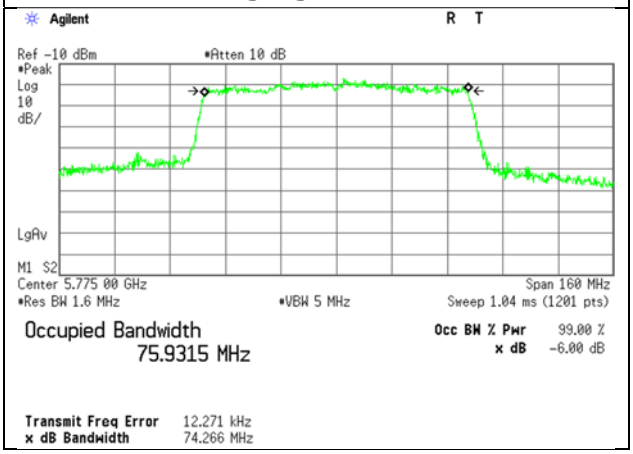
5530 MHz



5690 MHz



5775 MHz



6 dB Bandwidth

Report No.	13395143H
Test place	Ise EMC Lab. No.3 Measurement Room
Date	June 12, 2020
Temperature / Humidity	22 deg. C / 65 % RH
Engineer	Junki Nagatomi
Mode	Tx

11a

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]
Antenna 1	5745	16.119	> 0.500
	5785	16.427	> 0.500
	5825	16.163	> 0.500

11n-20

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]
Antenna 1	5745	17.640	> 0.500
	5785	17.573	> 0.500
	5825	17.610	> 0.500

11ac-20

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]
Antenna 1	5745	17.591	> 0.500
	5785	17.703	> 0.500
	5825	17.669	> 0.500

11n-40

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]
Antenna 1	5755	36.432	> 0.500
	5795	36.374	> 0.500

11ac-40

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]
Antenna 1	5755	36.334	> 0.500
	5795	36.486	> 0.500

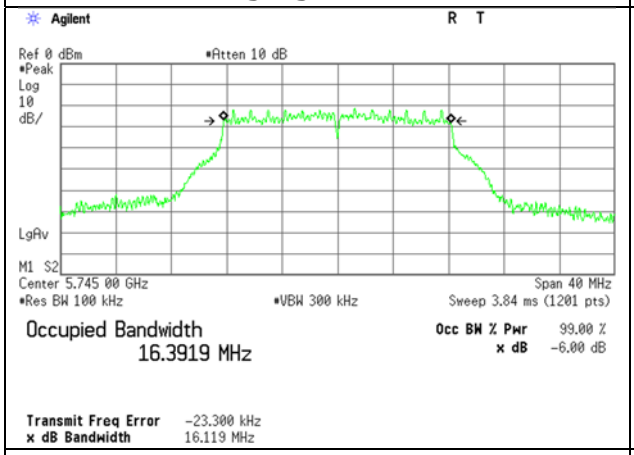
11ac-80

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]
Antenna 1	5775	75.439	> 0.500

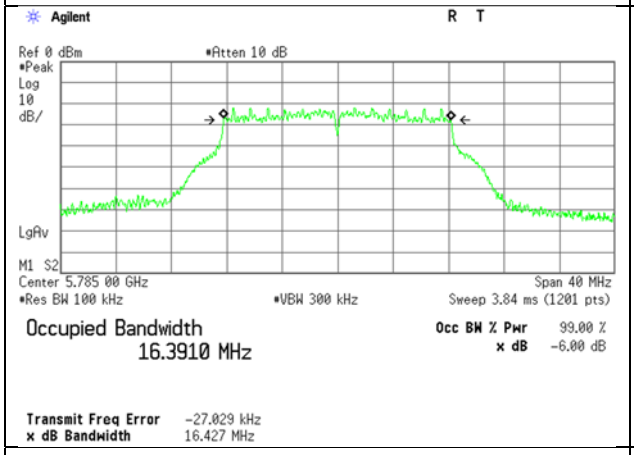
6 dB Bandwidth

11a, Antenna 1

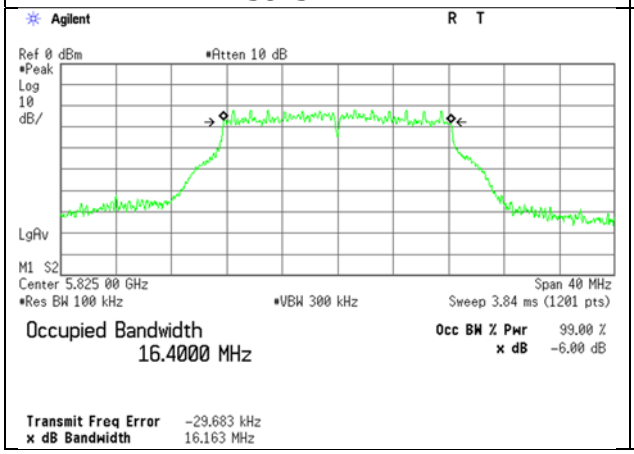
5745 MHz



5785 MHz

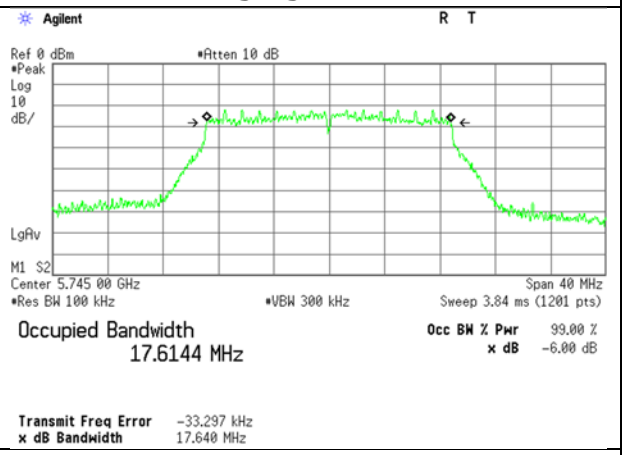


5825 MHz

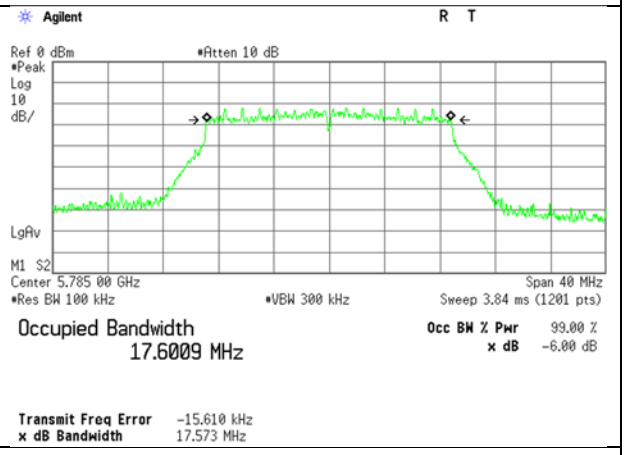


11n-20, Antenna 1

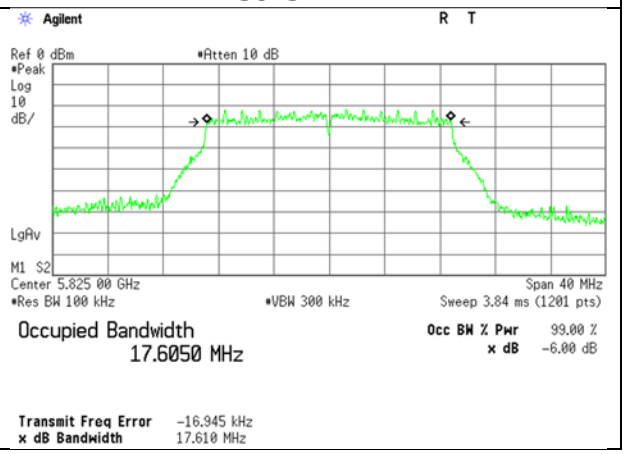
5745 MHz



5785 MHz



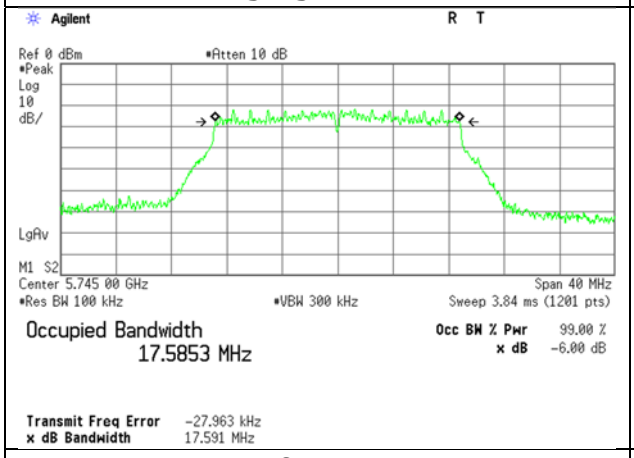
5825 MHz



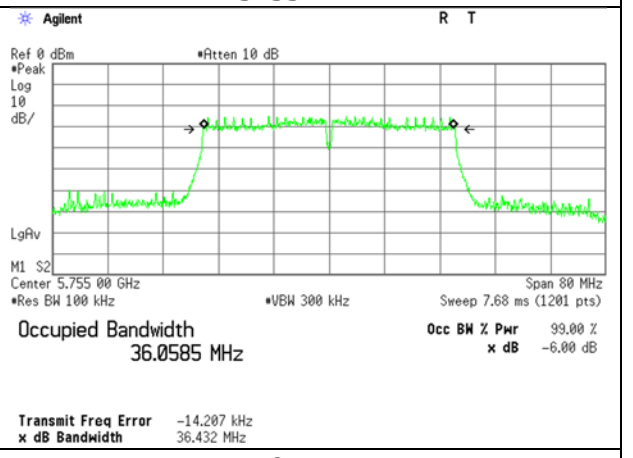
6 dB Bandwidth

11ac-20, Antenna 1

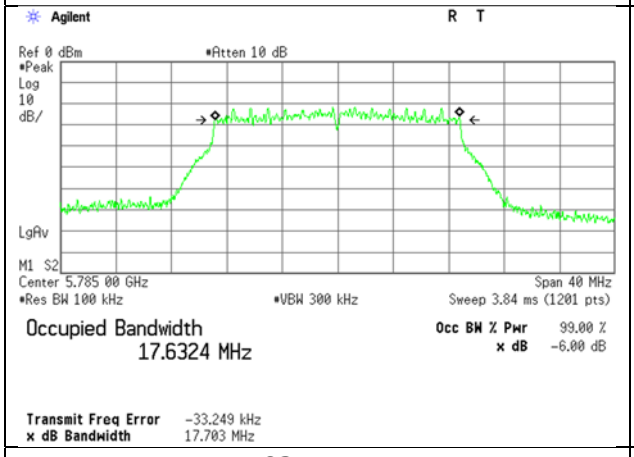
5745 MHz



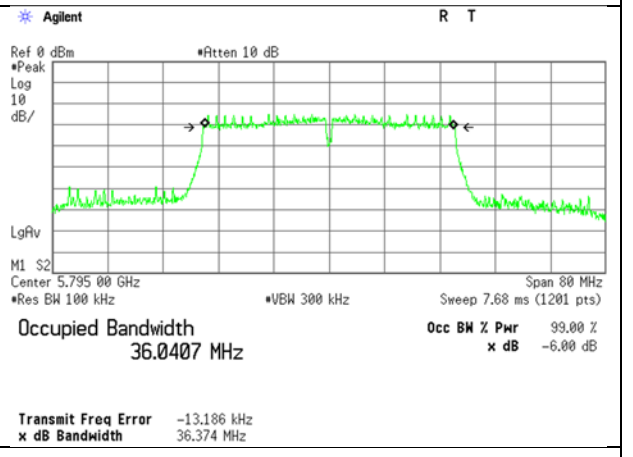
5755 MHz



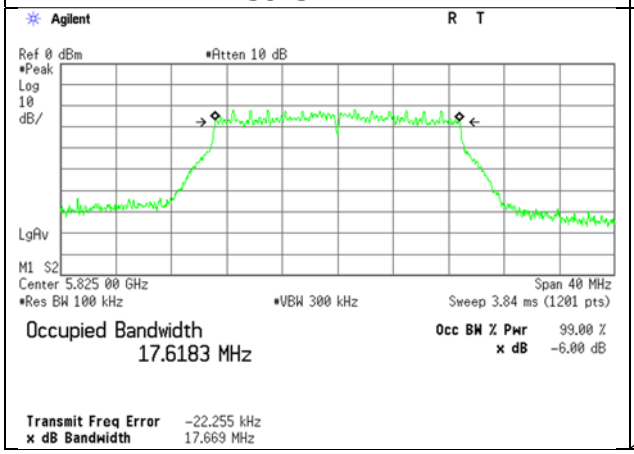
5785 MHz



5795 MHz



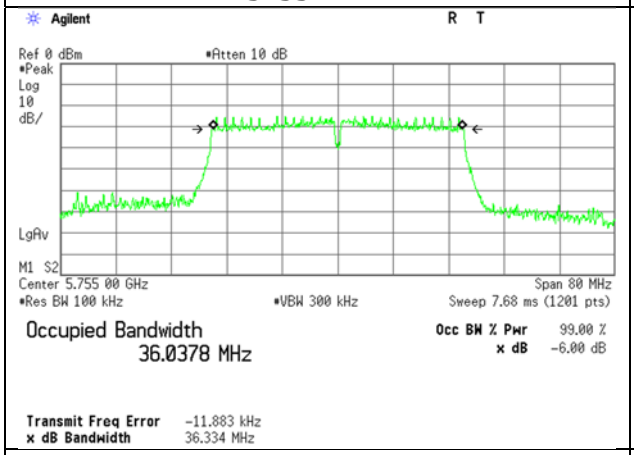
5825 MHz



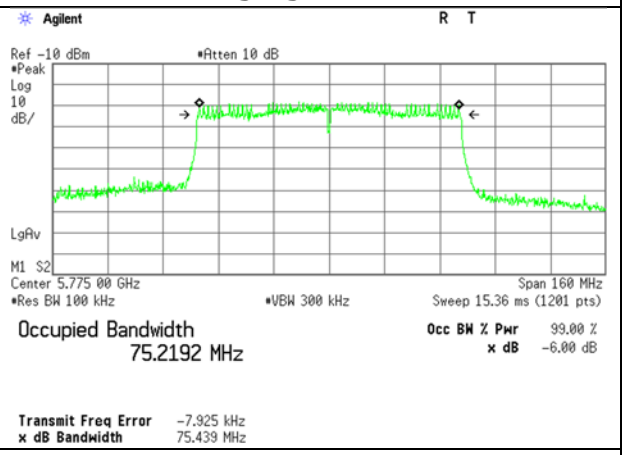
6 dB Bandwidth

11ac-40, Antenna 1

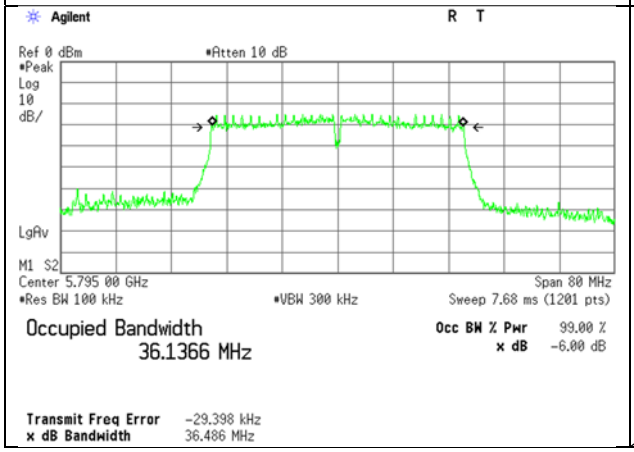
5755 MHz



5775 MHz



5795 MHz



Maximum Conducted Output Power

Report No.	13395143H
Test place	Ise EMC Lab. No.3 Measurement Room
Date	June 10, 2020
Temperature / Humidity	23 deg. C / 59 % RH
Engineer	Tomohisa Nakagawa
Mode	Tx 11a

11a Applied limit: 15.407, mobile and portable client device

Tested Frequency	Power Meter Reading	Cable Loss	Atten. Loss	Duty Factor	Antenna Gain	26 dB EBW (B for FCC)	99% OBW (B for IC)	Conducted Power Result		Limit	Margin	e.i.r.p. Result		Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBi]	[MHz]	[MHz]	[dBm]	[mW]	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[dB]
5280	-1.98	1.50	10.16	1.78	4.0	20.743	16.974	11.46	14.00	23.97	12.51	15.46	35.16	29.97	14.51
5300	-2.01	1.50	10.16	1.78	4.0	20.814	16.967	11.43	13.90	23.97	12.54	15.43	34.91	29.97	14.54
5320	-2.06	1.50	10.16	1.78	4.0	20.691	16.932	11.38	13.74	23.97	12.59	15.38	34.51	29.97	14.59
5500	-2.04	1.50	10.16	1.78	4.0	20.711	16.965	11.40	13.80	23.97	12.57	15.40	34.67	29.97	14.57
5580	-1.93	1.50	10.17	1.78	4.0	20.847	16.953	11.52	14.19	23.97	12.45	15.52	35.65	29.97	14.45
5700	-1.84	1.50	10.17	1.78	4.0	20.609	16.985	11.61	14.49	23.97	12.36	15.61	36.39	29.97	14.36
5720	-1.93	1.50	10.17	1.78	4.0	20.639	16.956	11.52	14.19	23.97	12.45	15.52	35.65	29.97	14.45
5745	-2.00	1.50	10.18	1.78	4.0	-	16.994	11.46	14.00	30.00	18.54	15.46	35.16	36.00	20.54
5785	-2.24	1.50	10.18	1.78	4.0	-	16.927	11.22	13.24	30.00	18.78	15.22	33.27	36.00	20.78
5825	-2.34	1.50	10.18	1.78	4.0	-	16.947	11.12	12.94	30.00	18.88	15.12	32.51	36.00	20.88

Sample Calculation:
Conducted Power Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor
e.i.r.p. Result = Conducted Power Result + Antenna Gain
Conducted Power Limit (5250 MHz-5350 MHz, 5470 MHz-5725 MHz) = 250 mW or (11 + 10logB) dBm, whichever is lower
Conducted Power Limit (5725 MHz-5850 MHz) = 1W

Maximum Conducted Output Power

Report No.	13395143H
Test place	Ise EMC Lab. No.3 Measurement Room
Date	June 10, 2020
Temperature / Humidity	23 deg. C / 59 % RH
Engineer	Tomohisa Nakagawa
Mode	Tx 11n-20

11n-20 Applied limit: 15.407, mobile and portable client device

Tested Frequency	Power Meter Reading	Cable Loss	Atten. Loss	Duty Factor	Antenna Gain	26 dB EBW (B for FCC)	99% OBW (B for IC)	Conducted Power Result		Limit	Margin	e.i.r.p. Result		Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBi]	[MHz]	[MHz]	[dBm]	[mW]	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[dB]
5280	-2.64	1.50	10.16	1.87	4.0	20.929	17.999	10.89	12.27	23.97	13.08	14.89	30.83	29.97	15.08
5300	-2.57	1.50	10.16	1.87	4.0	20.453	18.004	10.96	12.47	23.97	13.01	14.96	31.33	29.97	15.01
5320	-2.57	1.50	10.16	1.87	4.0	20.923	17.964	10.96	12.47	23.97	13.01	14.96	31.33	29.97	15.01
5500	-2.59	1.50	10.16	1.87	4.0	20.607	18.025	10.94	12.42	23.97	13.03	14.94	31.19	29.97	15.03
5580	-2.22	1.50	10.17	1.87	4.0	21.003	18.029	11.32	13.55	23.97	12.65	15.32	34.04	29.97	14.65
5700	-2.53	1.50	10.17	1.87	4.0	20.964	18.042	11.01	12.62	23.97	12.96	15.01	31.70	29.97	14.96
5720	-2.58	1.50	10.17	1.87	4.0	20.657	17.973	10.96	12.47	23.97	13.01	14.96	31.33	29.97	15.01
5745	-2.67	1.50	10.18	1.87	4.0	-	17.978	10.88	12.25	30.00	19.12	14.88	30.76	36.00	21.12
5785	-2.86	1.50	10.18	1.87	4.0	-	17.980	10.69	11.72	30.00	19.31	14.69	29.44	36.00	21.31
5825	-2.92	1.50	10.18	1.87	4.0	-	18.092	10.63	11.56	30.00	19.37	14.63	29.04	36.00	21.37

Sample Calculation:
Conducted Power Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor
e.i.r.p. Result = Conducted Power Result + Antenna Gain
Conducted Power Limit (5250 MHz-5350 MHz, 5470 MHz-5725 MHz) = 250 mW or (11 + 10logB) dBm, whichever is lower
Conducted Power Limit (5725 MHz-5850 MHz) = 1W

Maximum Conducted Output Power

Report No.	13395143H
Test place	Ise EMC Lab. No.3 Measurement Room
Date	June 10, 2020
Temperature / Humidity	23 deg. C / 59 % RH
Engineer	Tomohisa Nakagawa
Mode	Tx 11ac-20

11ac-20 Applied limit: 15.407, mobile and portable client device

Tested Frequency	Power Meter Reading	Cable Loss	Atten. Loss	Duty Factor	Antenna Gain	26 dB EBW (B for FCC)	99% OBW (B for IC)	Conducted Power Result		Limit	Margin	e.i.r.p. Result		Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBi]	[MHz]	[MHz]	[dBm]	[mW]	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[dB]
5280	-1.98	1.50	10.16	2.18	4.0	20.880	17.999	11.86	15.35	23.97	12.11	15.86	38.55	29.97	14.11
5300	-1.93	1.50	10.16	2.18	4.0	20.992	18.025	11.91	15.52	23.97	12.06	15.91	38.99	29.97	14.06
5320	-1.93	1.50	10.16	2.18	4.0	20.928	18.017	11.91	15.52	23.97	12.06	15.91	38.99	29.97	14.06
5500	-2.00	1.50	10.16	2.18	4.0	21.018	18.000	11.84	15.28	23.97	12.13	15.84	38.37	29.97	14.13
5580	-1.93	1.50	10.17	2.18	4.0	21.053	18.095	11.92	15.56	23.97	12.05	15.92	39.08	29.97	14.05
5700	-1.99	1.50	10.17	2.18	4.0	21.058	18.062	11.86	15.35	23.97	12.11	15.86	38.55	29.97	14.11
5720	-1.95	1.50	10.17	2.18	4.0	20.719	18.042	11.90	15.49	23.97	12.07	15.90	38.90	29.97	14.07
5745	-2.32	1.50	10.18	2.18	4.0	-	18.071	11.54	14.26	30.00	18.46	15.54	35.81	36.00	20.46
5785	-2.25	1.50	10.18	2.18	4.0	-	18.064	11.61	14.49	30.00	18.39	15.61	36.39	36.00	20.39
5825	-2.32	1.50	10.18	2.18	4.0	-	18.044	11.54	14.26	30.00	18.46	15.54	35.81	36.00	20.46

Sample Calculation:
Conducted Power Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor
e.i.r.p. Result = Conducted Power Result + Antenna Gain
Conducted Power Limit (5250 MHz-5350 MHz, 5470 MHz-5725 MHz) = 250 mW or (11 + 10logB) dBm, whichever is lower
Conducted Power Limit (5725 MHz-5850 MHz) = 1W

Maximum Conducted Output Power

Report No.	13395143H
Test place	Ise EMC Lab. No.3 Measurement Room
Date	June 10, 2020
Temperature / Humidity	23 deg. C / 59 % RH
Engineer	Tomohisa Nakagawa
Mode	Tx 11n-40

11n-40 Applied limit: 15.407, mobile and portable client device

Tested Frequency	Power Meter Reading	Cable Loss	Atten. Loss	Duty Factor	Antenna Gain	26 dB EBW (B for FCC)	99% OBW (B for IC)	Conducted Power Result		Limit	Margin	e.i.r.p. Result		Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBi]	[MHz]	[MHz]	[dBm]	[mW]	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[dB]
5310	-2.54	1.50	10.16	1.74	4.0	39.549	36.374	10.86	12.19	23.97	13.11	14.86	30.62	29.97	15.11
5510	-2.74	1.50	10.17	1.74	4.0	39.491	36.422	10.67	11.67	23.97	13.30	14.67	29.31	29.97	15.30
5550	-2.74	1.50	10.17	1.74	4.0	39.510	36.386	10.67	11.67	23.97	13.30	14.67	29.31	29.97	15.30
5670	-2.55	1.50	10.17	1.74	4.0	39.174	36.339	10.86	12.19	23.97	13.11	14.86	30.62	29.97	15.11
5710	-2.44	1.50	10.17	1.74	4.0	39.355	36.341	10.97	12.50	23.97	13.00	14.97	31.41	29.97	15.00
5755	-2.83	1.50	10.18	1.74	4.0	-	36.416	10.59	11.46	30.00	19.41	14.59	28.77	36.00	21.41
5795	-3.02	1.50	10.18	1.74	4.0	-	36.440	10.40	10.96	30.00	19.60	14.40	27.54	36.00	21.60

Sample Calculation:
Conducted Power Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor
e.i.r.p. Result = Conducted Power Result + Antenna Gain
Conducted Power Limit (5250 MHz-5350 MHz, 5470 MHz-5725 MHz) = 250 mW or (11 + 10logB) dBm, whichever is lower
Conducted Power Limit (5725 MHz-5850 MHz) = 1W

Maximum Conducted Output Power

Report No.	13395143H
Test place	Ise EMC Lab. No.3 Measurement Room
Date	June 10, 2020
Temperature / Humidity	23 deg. C / 59 % RH
Engineer	Tomohisa Nakagawa
Mode	Tx 11ac-40

11ac-40 Applied limit: 15.407, mobile and portable client device

Tested Frequency	Power Meter Reading	Cable Loss	Atten. Loss	Duty Factor	Antenna Gain	26 dB EBW (B for FCC)	99% OBW (B for IC)	Conducted Power Result		Limit	Margin	e.i.r.p. Result		Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBi]	[MHz]	[MHz]	[dBm]	[mW]	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[dB]
5310	-3.38	1.50	10.16	3.00	4.0	39.261	36.232	11.28	13.43	23.97	12.69	15.28	33.73	29.97	14.69
5510	-3.84	1.50	10.17	3.00	4.0	39.457	36.284	10.83	12.11	23.97	13.14	14.83	30.41	29.97	15.14
5550	-3.96	1.50	10.17	3.00	4.0	39.386	36.278	10.71	11.78	23.97	13.26	14.71	29.58	29.97	15.26
5670	-3.76	1.50	10.17	3.00	4.0	39.131	36.304	10.91	12.33	23.97	13.06	14.91	30.97	29.97	15.06
5710	-4.03	1.50	10.17	3.00	4.0	39.181	36.203	10.64	11.59	23.97	13.33	14.64	29.11	29.97	15.33
5755	-3.98	1.50	10.18	3.00	4.0	-	36.260	10.70	11.75	30.00	19.30	14.70	29.51	36.00	21.30
5795	-4.15	1.50	10.18	3.00	4.0	-	36.312	10.53	11.30	30.00	19.47	14.53	28.38	36.00	21.47

Sample Calculation:
Conducted Power Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor
e.i.r.p. Result = Conducted Power Result + Antenna Gain
Conducted Power Limit (5250 MHz-5350 MHz, 5470 MHz-5725 MHz) = 250 mW or (11 + 10logB) dBm, whichever is lower
Conducted Power Limit (5725 MHz-5850 MHz) = 1W

Maximum Conducted Output Power

Report No.	13395143H
Test place	Ise EMC Lab. No.3 Measurement Room
Date	June 10, 2020
Temperature / Humidity	23 deg. C / 59 % RH
Engineer	Tomohisa Nakagawa
Mode	Tx 11ac-80

11ac-80 Applied limit: 15.407, mobile and portable client device

Tested Frequency	Power Meter Reading	Cable Loss	Atten. Loss	Duty Factor	Antenna Gain	26 dB EBW (B for FCC)	99% OBW (B for IC)	Conducted Power Result		Limit	Margin	e.i.r.p. Result		Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBi]	[MHz]	[MHz]	[dBm]	[mW]	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[dB]
5530	-5.24	1.50	10.17	3.59	4.0	80.627	75.769	10.02	10.05	23.97	13.95	14.02	25.23	29.97	15.95
5690	-5.22	1.50	10.17	3.59	4.0	80.952	75.824	10.04	10.09	23.97	13.93	14.04	25.35	29.97	15.93
5775	-5.50	1.50	10.18	3.59	4.0	-	75.932	9.77	9.48	30.00	20.23	13.77	23.82	36.00	22.23

Sample Calculation:
Conducted Power Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor
e.i.r.p. Result = Conducted Power Result + Antenna Gain
Conducted Power Limit (5250 MHz-5350 MHz, 5470 MHz-5725 MHz) = 250 mW or (11 + 10logB) dBm, whichever is lower
Conducted Power Limit (5725 MHz-5850 MHz) = 1W

Maximum Conducted Output Power

Report No.	13395143H
Test place	Ise EMC Lab. No.3 Measurement Room
Date	June 10, 2020
Temperature / Humidity	23 deg. C / 59 % RH
Engineer	Tomohisa Nakagawa
Mode	Tx

5300 MHz

Mode	Rate Mbps	Reading [dBm]	Remarks
11a	6	-0.11	
	9	-0.03	
	12	0.00	
	18	-0.32	
	24	-0.10	
	36	-0.09	
	48	0.01	*
	54	-0.09	

* Worst rate

All comparison were carried out on same frequency and measurement factors.
The measurement system is different for power measurement and rate check.

5300 MHz

Mode	MCS Number	Reading [dBm]	Remarks
11n-20	0	-0.50	
	1	-0.61	
	2	-0.40	
	3	-0.57	
	4	-0.50	
	5	-0.38	
	6	-0.22	*
	7	-0.44	

* Worst rate

MCS Number	Reading [dBm]	GI	Remark
6	-0.22	Long	*
6	-0.30	Short	

* Worst Conditioin

All comparison were carried out on same frequency and measurement factors.
The measurement system is different for power measurement and rate check.

Maximum Conducted Output Power

Report No.	13395143H
Test place	Ise EMC Lab. No.3 Measurement Room
Date	June 10, 2020
Temperature / Humidity	23 deg. C / 59 % RH
Engineer	Tomohisa Nakagawa
Mode	Tx

5300 MHz

Mode	MCS Number	Reading [dBm]	Remarks
11ac-20	0	-0.36	
	1	-0.39	
	2	-0.41	
	3	-0.38	
	4	-0.38	
	5	-0.27	
	6	-0.22	
	7	-0.22	
	8	-0.20	*

* Worst rate

MCS Number	Reading [dBm]	GI	Remark
8	-0.20	Long	*
8	-0.29	Short	

* Worst Conditioin

All comparison were carried out on same frequency and measurement factors.
The measurement system is different for power measurement and rate check.

5310 MHz

Mode	MCS Number	Reading [dBm]	Remarks
11n-40	0	-0.79	
	1	-0.82	
	2	-0.62	
	3	-0.61	*
	4	-0.73	
	5	-0.67	
	6	-0.67	
	7	-0.70	

* Worst rate

MCS Number	Reading [dBm]	GI	Remark
3	-0.61	Long	*
3	-0.78	Short	

* Worst Conditioin

All comparison were carried out on same frequency and measurement factors.
The measurement system is different for power measurement and rate check.

Maximum Conducted Output Power

Report No.	13395143H
Test place	Ise EMC Lab. No.3 Measurement Room
Date	June 10, 2020
Temperature / Humidity	23 deg. C / 59 % RH
Engineer	Tomohisa Nakagawa
Mode	Tx

5310 MHz

Mode	MCS Number	Reading [dBm]	Remarks
11ac-40	0	-0.70	
	1	-0.84	
	2	-0.74	
	3	-0.65	
	4	-0.70	
	5	-0.66	
	6	-0.58	
	7	-0.62	
	8	-0.49	*
	9	-0.69	

* Worst rate

MCS Number	Reading [dBm]	GI	Remark
8	-0.49	Long	*
8	-0.56	Short	

* Worst Conditioin

All comparison were carried out on same frequency and measurement factors.
The measurement system is different for power measurement and rate check.

Maximum Conducted Output Power

Report No.	13395143H
Test place	Ise EMC Lab. No.3 Measurement Room
Date	June 10, 2020
Temperature / Humidity	23 deg. C / 59 % RH
Engineer	Tomohisa Nakagawa
Mode	Tx

5430 MHz

Mode	MCS Number	Reading [dBm]	Remarks
11ac-80	0	-1.62	
	1	-1.66	
	2	-1.66	
	3	-1.56	
	4	-1.54	
	5	-1.51	
	6	-1.42	
	7	-1.36	*
	8	-1.40	
	9	-1.38	

* Worst rate

MCS Number	Reading [dBm]	GI	Remark
7	-1.36	Long	*
7	-1.39	Short	

* Worst Conditioin

All comparison were carried out on same frequency and measurement factors.
The measurement system is different for power measurement and rate check.

Average Output Power
(Reference data for RF Exposure)

Report No.	13395143H
Test place	Ise EMC Lab. No.3 Measurement Room
Date	June 8, 2020
Temperature / Humidity	23 deg. C / 51 % RH
Engineer	Junki Nagatomi
Mode	Tx 11a

Antenna 1

Tested Frequency	Power Meter Reading	Cable Loss	Atten. Loss	Result (Timed average)		Duty factor	Result (Burst power average)	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dB]	[dBm]	[mW]
5280	0.05	1.50	10.16	11.71	14.83	0.29	12.00	15.85
5300	-0.07	1.50	10.16	11.59	14.42	0.29	11.88	15.42
5320	-0.10	1.50	10.16	11.56	14.32	0.29	11.85	15.31
5500	-0.15	1.50	10.16	11.51	14.16	0.29	11.80	15.14
5580	-0.07	1.50	10.17	11.60	14.45	0.29	11.89	15.45
5700	-0.31	1.50	10.17	11.36	13.68	0.29	11.65	14.62
5720	-0.33	1.50	10.17	11.34	13.61	0.29	11.63	14.55
5745	-0.66	1.50	10.18	11.02	12.65	0.29	11.31	13.52
5785	-0.64	1.50	10.18	11.04	12.71	0.29	11.33	13.58
5825	-0.76	1.50	10.18	10.92	12.36	0.29	11.21	13.21

Sample Calculation:
Result (Timed average) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss
Result (Burst power average) = Time average + Duty factor
*The equipment and cables were not used for factor 0 dB of the data sheets.

The average output power was measured with the lowest order modulation and lowest data rate configuration in each IEEE 802.11 mode based on KDB 248227 D01.

Average Output Power
(Reference data for RF Exposure)

Report No.	13395143H
Test place	Ise EMC Lab. No.3 Measurement Room
Date	June 8, 2020
Temperature / Humidity	23 deg. C / 51 % RH
Engineer	Junki Nagatomi
Mode	Tx 11n-20

Antenna 1

Tested Frequency	Power Meter Reading	Cable Loss	Atten. Loss	Result (Timed average)		Duty factor	Result (Burst power average)	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dB]	[dBm]	[mW]
5280	-0.46	1.50	10.16	11.20	13.18	0.30	11.50	14.13
5300	-0.46	1.50	10.16	11.20	13.18	0.30	11.50	14.13
5320	-0.40	1.50	10.16	11.26	13.37	0.30	11.56	14.32
5500	-0.42	1.50	10.16	11.24	13.30	0.30	11.54	14.26
5580	-0.43	1.50	10.17	11.24	13.30	0.30	11.54	14.26
5700	-0.75	1.50	10.17	10.92	12.36	0.30	11.22	13.24
5720	-0.81	1.50	10.17	10.86	12.19	0.30	11.16	13.06
5745	-1.02	1.50	10.18	10.66	11.64	0.30	10.96	12.47
5785	-1.14	1.50	10.18	10.54	11.32	0.30	10.84	12.13
5825	-1.26	1.50	10.18	10.42	11.02	0.30	10.72	11.80

Sample Calculation:
Result (Timed average) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss
Result (Burst power average) = Time average + Duty factor
*The equipment and cables were not used for factor 0 dB of the data sheets.

The average output power was measured with the lowest order modulation and lowest data rate configuration in each IEEE 802.11 mode based on KDB 248227 D01.

Average Output Power
(Reference data for RF Exposure)

Report No.	13395143H
Test place	Ise EMC Lab. No.3 Measurement Room
Date	June 8, 2020
Temperature / Humidity	23 deg. C / 51 % RH
Engineer	Junki Nagatomi
Mode	Tx 11ac-20

Antenna 1

Tested Frequency	Power Meter Reading	Cable Loss	Atten. Loss	Result (Timed average)		Duty factor	Result (Burst power average)	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dB]	[dBm]	[mW]
5280	-0.37	1.50	10.16	11.29	13.46	0.31	11.60	14.45
5300	-0.36	1.50	10.16	11.30	13.49	0.31	11.61	14.49
5320	-0.47	1.50	10.16	11.19	13.15	0.31	11.50	14.13
5500	-0.53	1.50	10.16	11.13	12.97	0.31	11.44	13.93
5580	-0.53	1.50	10.17	11.14	13.00	0.31	11.45	13.96
5700	-0.57	1.50	10.17	11.10	12.88	0.31	11.41	13.84
5720	-0.70	1.50	10.17	10.97	12.50	0.31	11.28	13.43
5745	-1.12	1.50	10.18	10.56	11.38	0.31	10.87	12.22
5785	-1.14	1.50	10.18	10.54	11.32	0.31	10.85	12.16
5825	-1.26	1.50	10.18	10.42	11.02	0.31	10.73	11.83

Sample Calculation:
Result (Timed average) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss
Result (Burst power average) = Time average + Duty factor
*The equipment and cables were not used for factor 0 dB of the data sheets.

The average output power was measured with the lowest order modulation and lowest data rate configuration in each IEEE 802.11 mode based on KDB 248227 D01.

Average Output Power
(Reference data for RF Exposure)

Report No.	13395143H
Test place	Ise EMC Lab. No.3 Measurement Room
Date	June 8, 2020
Temperature / Humidity	23 deg. C / 51 % RH
Engineer	Junki Nagatomi
Mode	Tx 11n-40

Tested Frequency	Power Meter Reading	Cable Loss	Atten. Loss	Result (Timed average)		Duty factor	Result (Burst power average)	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dB]	[dBm]	[mW]
5270	-1.00	1.50	10.16	10.66	11.64	0.59	11.25	13.34
5310	-1.02	1.50	10.16	10.64	11.59	0.59	11.23	13.27
5510	-1.16	1.50	10.17	10.51	11.25	0.59	11.10	12.88
5550	-1.07	1.50	10.17	10.60	11.48	0.59	11.19	13.15
5670	-1.31	1.50	10.17	10.36	10.86	0.59	10.95	12.45
5710	-1.30	1.50	10.17	10.37	10.89	0.59	10.96	12.47
5755	-1.53	1.50	10.18	10.15	10.35	0.59	10.74	11.86
5795	-1.83	1.50	10.18	9.85	9.66	0.59	10.44	11.07

Sample Calculation:
Result (Timed average) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss
Result (Burst power average) = Time average + Duty factor
*The equipment and cables were not used for factor 0 dB of the data sheets.

The average output power was measured with the lowest order modulation and lowest data rate configuration in each IEEE 802.11 mode based on KDB 248227 D01.

Average Output Power
(Reference data for RF Exposure)

Report No.	13395143H
Test place	Ise EMC Lab. No.3 Measurement Room
Date	June 8, 2020
Temperature / Humidity	23 deg. C / 51 % RH
Engineer	Junki Nagatomi
Mode	Tx 11ac-40

Tested Frequency	Power Meter Reading	Cable Loss	Atten. Loss	Result (Timed average)		Duty factor	Result (Burst power average)	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dB]	[dBm]	[mW]
5270	-1.05	1.50	10.16	10.61	11.51	0.59	11.20	13.18
5310	-1.00	1.50	10.16	10.66	11.64	0.59	11.25	13.34
5510	-1.15	1.50	10.17	10.52	11.27	0.59	11.11	12.91
5550	-1.08	1.50	10.17	10.59	11.46	0.59	11.18	13.12
5670	-1.35	1.50	10.17	10.32	10.76	0.59	10.91	12.33
5710	-1.30	1.50	10.17	10.37	10.89	0.59	10.96	12.47
5755	-1.56	1.50	10.18	10.12	10.28	0.59	10.71	11.78
5795	-1.73	1.50	10.18	9.95	9.89	0.59	10.54	11.32

Sample Calculation:
Result (Timed average) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss
Result (Burst power average) = Time average + Duty factor
*The equipment and cables were not used for factor 0 dB of the data sheets.

The average output power was measured with the lowest order modulation and lowest data rate configuration in each IEEE 802.11 mode based on KDB 248227 D01.

Average Output Power
(Reference data for RF Exposure)

Report No.	13395143H
Test place	Ise EMC Lab. No.3 Measurement Room
Date	June 8, 2020
Temperature / Humidity	23 deg. C / 51 % RH
Engineer	Junki Nagatomi
Mode	Tx 11ac-80

Tested Frequency	Power Meter Reading	Cable Loss	Atten. Loss	Result (Timed average)		Duty factor	Result (Burst power average)	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dB]	[dBm]	[mW]
5530	-2.63	1.50	10.17	9.04	8.02	1.11	10.15	10.35
5690	-2.74	1.50	10.17	8.93	7.82	1.11	10.04	10.09
5775	-3.22	1.50	10.18	8.46	7.01	1.11	9.57	9.06

Sample Calculation:
Result (Timed average) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss
Result (Burst power average) = Time average + Duty factor
*The equipment and cables were not used for factor 0 dB of the data sheets.

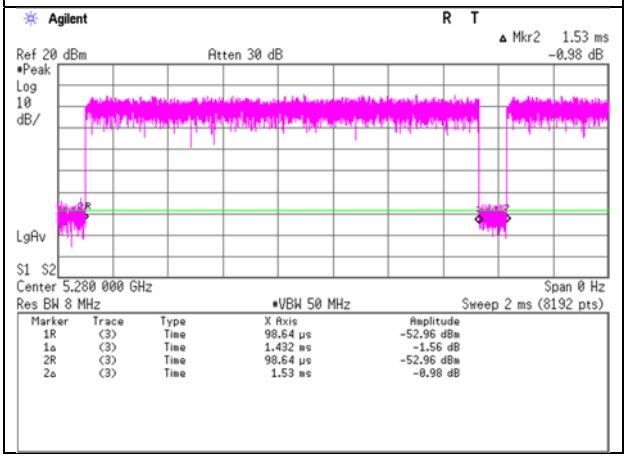
The average output power was measured with the lowest order modulation and lowest data rate configuration in each IEEE 802.11 mode based on KDB 248227 D01.

Burst rate confirmation

Report No.	13395143H
Test place	Ise EMC Lab. No.3 Measurement Room
Date	June 8, 2020
Temperature / Humidity	23 deg. C / 51 % RH
Engineer	Junki Nagatomi
Mode	Tx

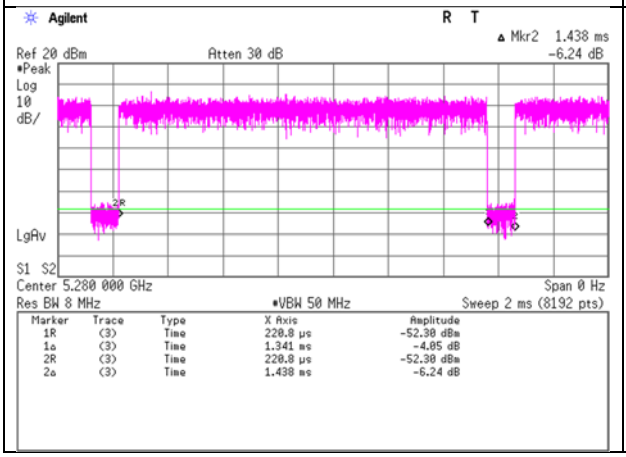
11a 6 Mbps

Tx on / (Tx on + Tx off) =	**0.936**
Tx on / (Tx on + Tx off) * 100 =	**93.6 %**
Duty factor = 10 * log (1.53 / 1.432) =	**0.29 dB**



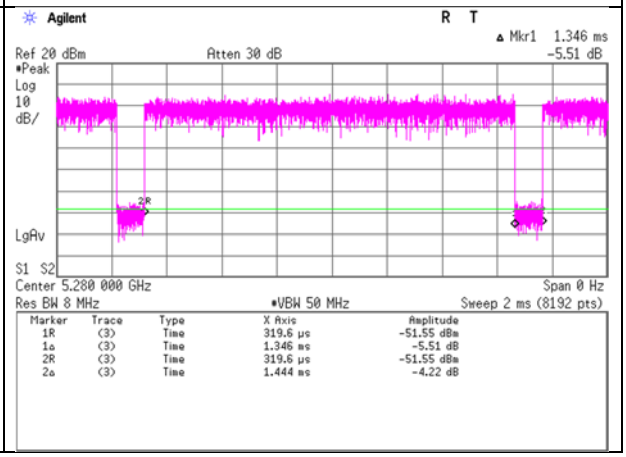
11n-20 MCS 0

Tx on / (Tx on + Tx off) =	**0.933**
Tx on / (Tx on + Tx off) * 100 =	**93.3 %**
Duty factor = 10 * log (1.438 / 1.341) =	**0.30 dB**



11ac-20 MCS 0

Tx on / (Tx on + Tx off) =	**0.932**
Tx on / (Tx on + Tx off) * 100 =	**93.2 %**
Duty factor = 10 * log (1.444 / 1.346) =	**0.31 dB**

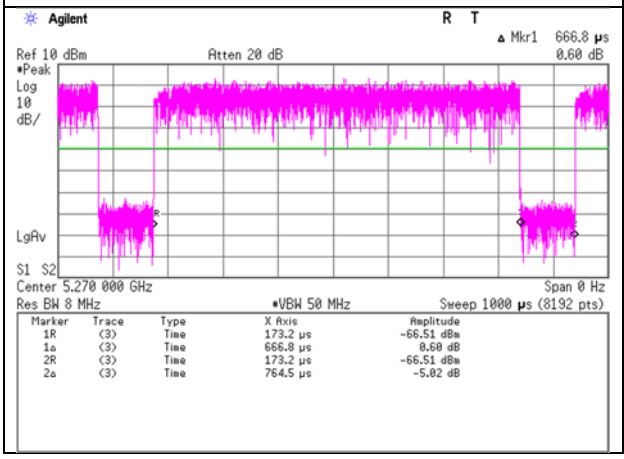


Burst rate confirmation

Report No.	13395143H
Test place	Ise EMC Lab. No.3 Measurement Room
Date	June 8, 2020
Temperature / Humidity	23 deg. C / 51 % RH
Engineer	Junki Nagatomi
Mode	Tx

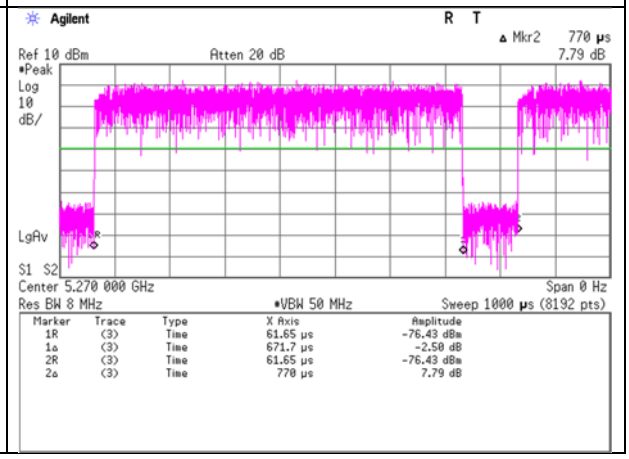
11n-40 MCS 0

Tx on / (Tx on + Tx off) =	0.872
Tx on / (Tx on + Tx off) * 100 =	87.2 %
Duty factor = 10 * log (0.7645 / 0.6668) =	0.59 dB



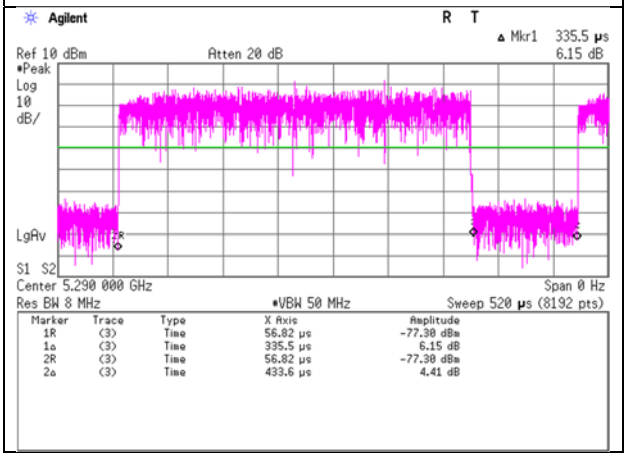
11ac-40 MCS 0

Tx on / (Tx on + Tx off) =	0.872
Tx on / (Tx on + Tx off) * 100 =	87.2 %
Duty factor = 10 * log (0.77 / 0.6717) =	0.59 dB



11ac-80 MCS 0

Tx on / (Tx on + Tx off) =	0.774
Tx on / (Tx on + Tx off) * 100 =	77.4 %
Duty factor = 10 * log (0.4336 / 0.3355) =	1.11 dB

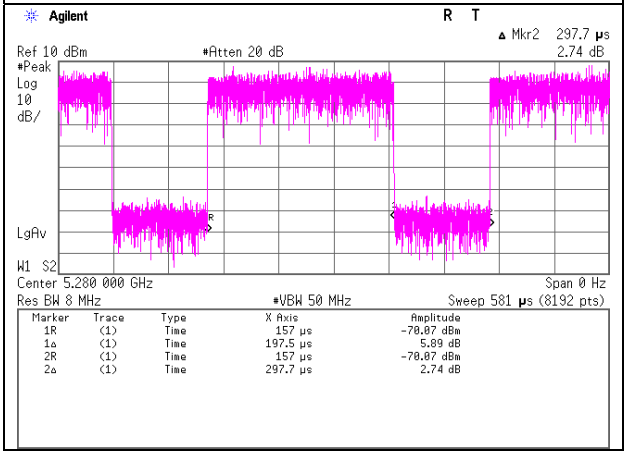


Burst rate confirmation

Report No.	13395143H
Test place	Ise EMC Lab. No.3 Measurement Room
Date	June 11, 2020
Temperature / Humidity	22 deg. C / 55 % RH
Engineer	Junki Nagatomi
Mode	Tx

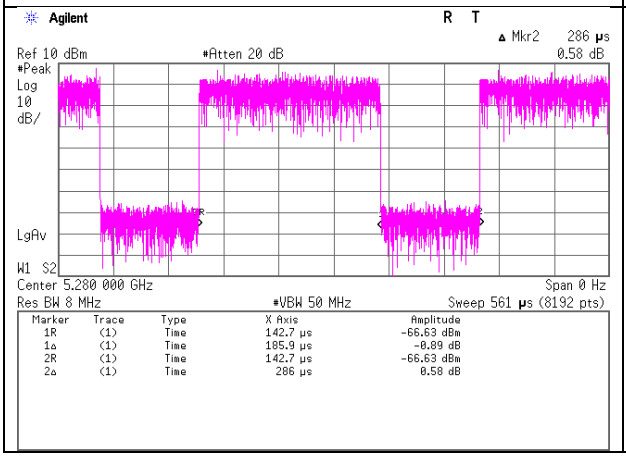
11a 48 Mbps

Tx on / (Tx on + Tx off) =	**0.663**
Tx on / (Tx on + Tx off) * 100 =	**66.3 %**
Duty factor = 10 * log (297.7 / 197.5) =	**1.78 dB**



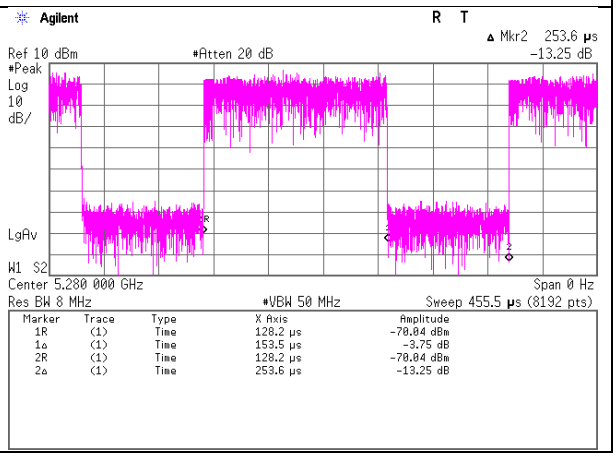
11n-20 MCS 6

Tx on / (Tx on + Tx off) =	**0.650**
Tx on / (Tx on + Tx off) * 100 =	**65.0 %**
Duty factor = 10 * log (286 / 185.9) =	**1.87 dB**



11ac-20 MCS 8

Tx on / (Tx on + Tx off) =	**0.605**
Tx on / (Tx on + Tx off) * 100 =	**60.5 %**
Duty factor = 10 * log (253.6 / 153.5) =	**2.18 dB**

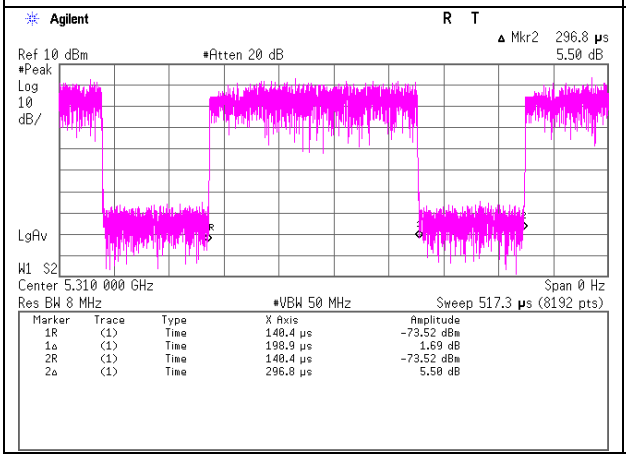


Burst rate confirmation

Report No.	13395143H
Test place	Ise EMC Lab. No.3 Measurement Room
Date	June 11, 2020
Temperature / Humidity	22 deg. C / 55 % RH
Engineer	Junki Nagatomi
Mode	Tx

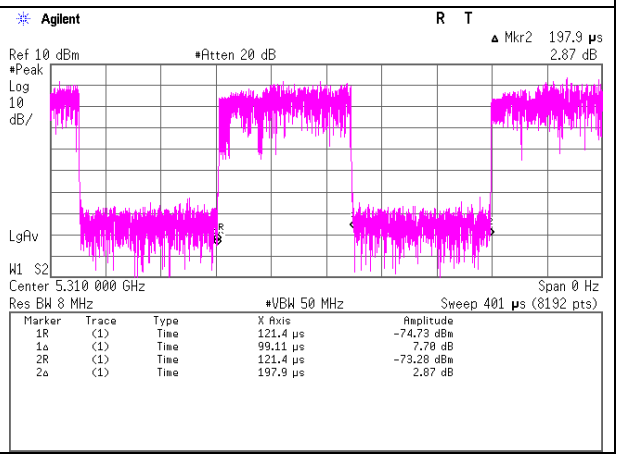
11n-40 MCS 3

Tx on / (Tx on + Tx off) = 0.670
Tx on / (Tx on + Tx off) * 100 = 67.0 %
Duty factor = 10 * log (296.8 / 198.9) = 1.74 dB



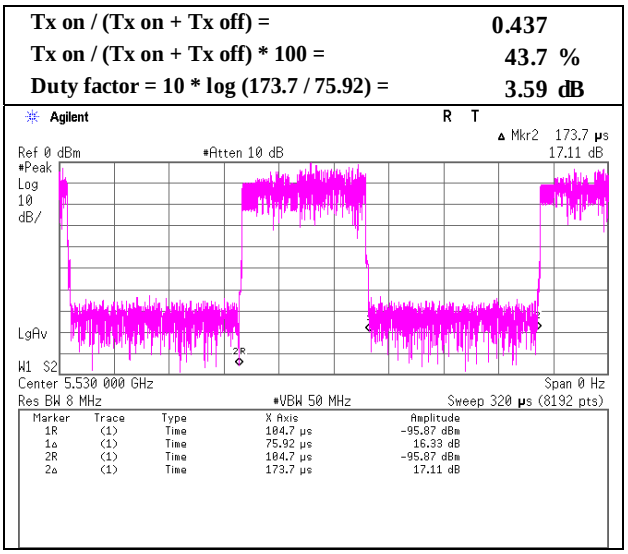
11ac-40 MCS 8

Tx on / (Tx on + Tx off) = 0.501
Tx on / (Tx on + Tx off) * 100 = 50.1 %
Duty factor = 10 * log (197.9 / 99.11) = 3.00 dB



11ac-80 MCS 7

Tx on / (Tx on + Tx off) = 0.437
Tx on / (Tx on + Tx off) * 100 = 43.7 %
Duty factor = 10 * log (173.7 / 75.92) = 3.59 dB



Maximum Power Spectral Density

Report No.	13395143H
Test place	Ise EMC Lab. No.4 Measurement Room
Date	June 16, 2020
Temperature / Humidity	22 deg. C / 52 % RH
Engineer	Junki Nagatomi
Mode	Tx 11a

Antenna 1

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	PSD Reading [dBm /MHz]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Antenna Gain [dBi]	RBW Correction Factor [dB]	PSD (Conducted) Result [dBm /MHz]	PSD (Conducted) Limit [dBm /MHz]	PSD (Conducted) Margin [dB]	PSD (e.i.r.p.) Result [dBm /MHz]	PSD (e.i.r.p.) Limit [dBm /MHz]	PSD (e.i.r.p.) Margin [dB]
5280	-21.59	1.50	20.00	1.78	4.0	0.00	1.69	11.00	9.31	5.69	17.00	11.31
5300	-22.48	1.50	20.00	1.78	4.0	0.00	0.80	11.00	10.20	4.80	17.00	12.20
5320	-22.01	1.50	20.00	1.78	4.0	0.00	1.27	11.00	9.73	5.27	17.00	11.73
5500	-22.29	1.50	20.01	1.78	4.0	0.00	1.01	11.00	10.00	5.01	17.00	12.00
5580	-21.86	1.50	20.01	1.78	4.0	0.00	1.43	11.00	9.57	5.43	17.00	11.57
5700	-22.03	1.50	20.01	1.78	4.0	0.00	1.26	11.00	9.74	5.26	17.00	11.74
5720	-21.60	1.50	20.00	1.78	4.0	0.00	1.68	11.00	9.32	5.68	17.00	11.32
5745	-25.26	1.50	20.00	1.78	4.0	0.27	-1.71	30.00	31.71	2.29	36.00	33.71
5785	-24.90	1.50	20.00	1.78	4.0	0.27	-1.35	30.00	31.35	2.65	36.00	33.35
5825	-24.95	1.50	20.00	1.78	4.0	0.27	-1.41	30.00	31.41	2.59	36.00	33.41

Sample Calculation:
PSD: Power Spectral Density
The PSD within 5725 MHz to 5825 MHz are based on any 500 kHz band.
RBW Correction Factor = 10 * log (Specified bandwidth / Measured bandwidth)
PSD Result (Conducted) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor + RBW Correction Factor
PSD Result (e.i.r.p.) = Conducted PSD Result + Antenna Gain

Maximum Power Spectral Density

Report No.	13395143H
Test place	Ise EMC Lab. No.4 Measurement Room
Date	June 16, 2020
Temperature / Humidity	22 deg. C / 52 % RH
Engineer	Junki Nagatomi
Mode	Tx 11n-20

Antenna 1

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	PSD Reading [dBm /MHz]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Antenna Gain [dBi]	RBW Correction Factor [dB]	PSD (Conducted) Result [dBm /MHz]	PSD (Conducted) Limit [dBm /MHz]	PSD (Conducted) Margin [dB]	PSD (e.i.r.p.) Result [dBm /MHz]	PSD (e.i.r.p.) Limit [dBm /MHz]	PSD (e.i.r.p.) Margin [dB]
5280	-22.84	1.50	20.00	1.87	4.0	0.00	0.53	11.00	10.47	4.53	17.00	12.47
5300	-23.02	1.50	20.00	1.87	4.0	0.00	0.35	11.00	10.65	4.35	17.00	12.65
5320	-22.92	1.50	20.00	1.87	4.0	0.00	0.45	11.00	10.55	4.45	17.00	12.55
5500	-22.77	1.50	20.01	1.87	4.0	0.00	0.61	11.00	10.39	4.61	17.00	12.39
5580	-22.76	1.50	20.01	1.87	4.0	0.00	0.63	11.00	10.38	4.63	17.00	12.38
5700	-22.45	1.50	20.01	1.87	4.0	0.00	0.93	11.00	10.07	4.93	17.00	12.07
5720	-22.62	1.50	20.00	1.87	4.0	0.00	0.75	11.00	10.25	4.75	17.00	12.25
5745	-26.10	1.50	20.00	1.87	4.0	0.27	-2.46	30.00	32.46	1.54	36.00	34.46
5785	-25.84	1.50	20.00	1.87	4.0	0.27	-2.20	30.00	32.20	1.80	36.00	34.20
5825	-25.91	1.50	20.00	1.87	4.0	0.27	-2.27	30.00	32.27	1.73	36.00	34.27

Sample Calculation:
PSD: Power Spectral Density
The PSD within 5725 MHz to 5825 MHz are based on any 500 kHz band.
RBW Correction Factor = 10 * log (Specified bandwidth / Measured bandwidth)
PSD Result (Conducted) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor + RBW Correction Factor
PSD Result (e.i.r.p.) = Conducted PSD Result + Antenna Gain

Maximum Power Spectral Density

Report No.	13395143H
Test place	Ise EMC Lab. No.4 Measurement Room
Date	June 16, 2020
Temperature / Humidity	22 deg. C / 52 % RH
Engineer	Junki Nagatomi
Mode	Tx 11ac-20

Antenna 1 Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	PSD Reading [dBm /MHz]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Antenna Gain [dBi]	RBW Correction Factor [dB]	PSD (Conducted) Result [dBm /MHz]	PSD (Conducted) Limit [dBm /MHz]	PSD (Conducted) Margin [dB]	PSD (e.i.r.p.) Result [dBm /MHz]	PSD (e.i.r.p.) Limit [dBm /MHz]	PSD (e.i.r.p.) Margin [dB]
5280	-22.88	1.50	20.00	2.18	4.0	0.00	0.80	11.00	10.20	4.80	17.00	12.20
5300	-22.97	1.50	20.00	2.18	4.0	0.00	0.71	11.00	10.29	4.71	17.00	12.29
5320	-23.11	1.50	20.00	2.18	4.0	0.00	0.57	11.00	10.43	4.57	17.00	12.43
5500	-23.41	1.50	20.01	2.18	4.0	0.00	0.28	11.00	10.72	4.28	17.00	12.72
5580	-23.04	1.50	20.01	2.18	4.0	0.00	0.65	11.00	10.35	4.65	17.00	12.35
5700	-22.88	1.50	20.01	2.18	4.0	0.00	0.81	11.00	10.19	4.81	17.00	12.19
5720	-21.84	1.50	20.00	2.18	4.0	0.00	1.84	11.00	9.16	5.84	17.00	11.16
5745	-26.26	1.50	20.00	2.18	4.0	0.27	-2.31	30.00	32.31	1.69	36.00	34.31
5785	-26.46	1.50	20.00	2.18	4.0	0.27	-2.52	30.00	32.52	1.48	36.00	34.52
5825	-26.38	1.50	20.00	2.18	4.0	0.27	-2.44	30.00	32.44	1.56	36.00	34.44

Sample Calculation:
PSD: Power Spectral Density
The PSD within 5725 MHz to 5825 MHz are based on any 500 kHz band.
RBW Correction Factor = 10 * log (Specified bandwidth / Measured bandwidth)
PSD Result (Conducted) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor + RBW Correction Factor
PSD Result (e.i.r.p.) = Conducted PSD Result + Antenna Gain

Maximum Power Spectral Density

Report No.	13395143H
Test place	Ise EMC Lab. No.4 Measurement Room
Date	June 16, 2020
Temperature / Humidity	22 deg. C / 52 % RH
Engineer	Junki Nagatomi
Mode	Tx 11n-40

Antenna 1

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	PSD Reading [dBm /MHz]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Antenna Gain [dBi]	RBW Correction Factor [dB]	PSD (Conducted) Result [dBm /MHz]	PSD (Conducted) Limit [dBm /MHz]	PSD (Conducted) Margin [dB]	PSD (e.i.r.p.) Result [dBm /MHz]	PSD (e.i.r.p.) Limit [dBm /MHz]	PSD (e.i.r.p.) Margin [dB]
5310	-25.92	1.50	20.00	1.74	4.0	0.00	-2.68	11.00	13.68	1.32	17.00	15.68
5510	-26.26	1.50	20.01	1.74	4.0	0.00	-3.01	11.00	14.01	0.99	17.00	16.01
5550	-26.22	1.50	21.01	1.74	4.0	1.00	-0.97	11.00	11.97	3.03	17.00	13.97
5670	-26.12	1.50	20.01	1.74	4.0	0.00	-2.87	11.00	13.87	1.13	17.00	15.87
5710	-26.02	1.50	20.01	1.74	4.0	0.00	-2.77	11.00	13.77	1.23	17.00	15.77
5755	-29.46	1.50	20.00	1.74	4.0	0.27	-5.95	30.00	35.95	-1.95	36.00	37.95
5795	-29.33	1.50	20.00	1.74	4.0	0.27	-5.82	30.00	35.82	-1.82	36.00	37.82

Sample Calculation:
PSD: Power Spectral Density
The PSD within 5725 MHz to 5825 MHz are based on any 500 kHz band.
RBW Correction Factor = 10 * log (Specified bandwidth / Measured bandwidth)
PSD Result (Conducted) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor + RBW Correction Factor
PSD Result (e.i.r.p.) = Conducted PSD Result + Antenna Gain

Maximum Power Spectral Density

Report No.	13395143H
Test place	Ise EMC Lab. No.4 Measurement Room
Date	June 16, 2020
Temperature / Humidity	22 deg. C / 52 % RH
Engineer	Junki Nagatomi
Mode	Tx 11ac-40

Antenna 1

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	PSD Reading [dBm /MHz]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Antenna Gain [dBi]	RBW Correction Factor [dB]	PSD (Conducted) Result [dBm /MHz]	PSD (Conducted) Limit [dBm /MHz]	PSD (Conducted) Margin [dB]	PSD (e.i.r.p.) Result [dBm /MHz]	PSD (e.i.r.p.) Limit [dBm /MHz]	PSD (e.i.r.p.) Margin [dB]
5310	-26.98	1.50	20.00	3.00	4.0	0.00	-2.48	11.00	13.48	1.52	17.00	15.48
5510	-26.99	1.50	20.01	3.00	4.0	0.00	-2.48	11.00	13.48	1.52	17.00	15.48
5550	-27.74	1.50	21.01	3.00	4.0	1.00	-1.23	11.00	12.23	2.77	17.00	14.23
5670	-26.90	1.50	20.01	3.00	4.0	0.00	-2.39	11.00	13.39	1.61	17.00	15.39
5710	-27.07	1.50	20.01	3.00	4.0	0.00	-2.56	11.00	13.56	1.45	17.00	15.56
5755	-29.92	1.50	20.00	3.00	4.0	0.27	-5.15	30.00	35.15	-1.15	36.00	37.15
5795	-30.34	1.50	20.00	3.00	4.0	0.27	-5.57	30.00	35.57	-1.57	36.00	37.57

Sample Calculation:
PSD: Power Spectral Density
The PSD within 5725 MHz to 5825 MHz are based on any 500 kHz band.
RBW Correction Factor = 10 * log (Specified bandwidth / Measured bandwidth)
PSD Result (Conducted) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor + RBW Correction Factor
PSD Result (e.i.r.p.) = Conducted PSD Result + Antenna Gain

Maximum Power Spectral Density

Report No.	13395143H
Test place	Ise EMC Lab. No.4 Measurement Room
Date	June 16, 2020
Temperature / Humidity	22 deg. C / 52 % RH
Engineer	Junki Nagatomi
Mode	Tx 11ac-80

Antenna 1

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	PSD Reading [dBm /MHz]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Antenna Gain [dBi]	RBW Correction Factor [dB]	PSD (Conducted) Result [dBm /MHz]	PSD (Conducted) Limit [dBm /MHz]	PSD (Conducted) Margin [dB]	PSD (e.i.r.p.) Result [dBm /MHz]	PSD (e.i.r.p.) Limit [dBm /MHz]	PSD (e.i.r.p.) Margin [dB]
5530	-31.46	1.50	20.01	3.59	4.0	0.00	-6.36	11.00	17.36	-2.36	17.00	19.36
5690	-31.12	1.50	20.01	3.59	4.0	0.00	-6.02	11.00	17.02	-2.02	17.00	19.02
5775	-33.74	1.50	20.00	3.59	4.0	0.27	-8.38	30.00	38.38	-4.38	36.00	40.38

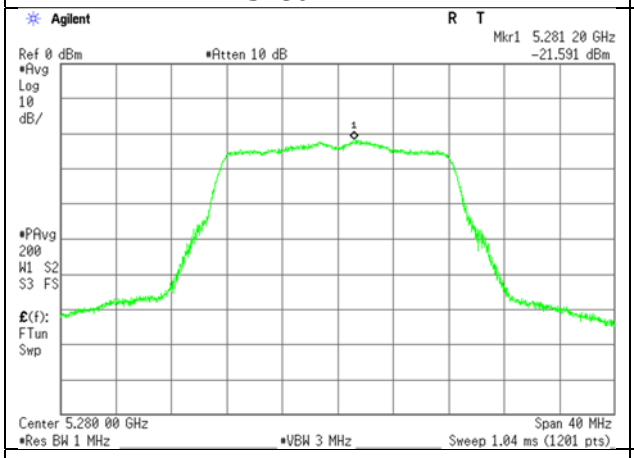
Sample Calculation:
PSD: Power Spectral Density
The PSD within 5725 MHz to 5825 MHz are based on any 500 kHz band.
RBW Correction Factor = 10 * log (Specified bandwidth / Measured bandwidth)
PSD Result (Conducted) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor + RBW Correction Factor
PSD Result (e.i.r.p.) = Conducted PSD Result + Antenna Gain
The conducted PSD limit was reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. (All frequencies for FCC, 5725 MHz-5850 MHz for IC)

Maximum Power Spectral Density

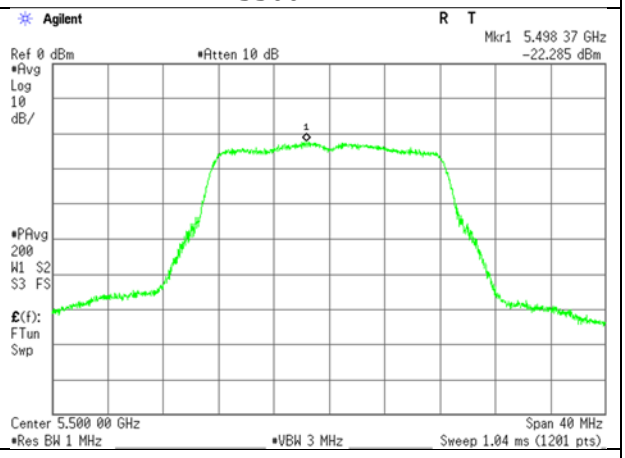
Report No.	13395143H
Test place	Ise EMC Lab. No.4 Measurement Room
Date	June 16, 2020
Temperature / Humidity	22 deg. C / 52 % RH
Engineer	Junki Nagatomi
Mode	Tx 11a

11a, Antenna 1

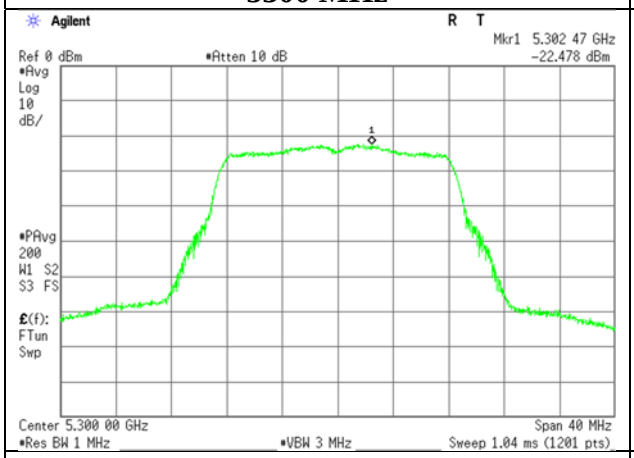
5280 MHz



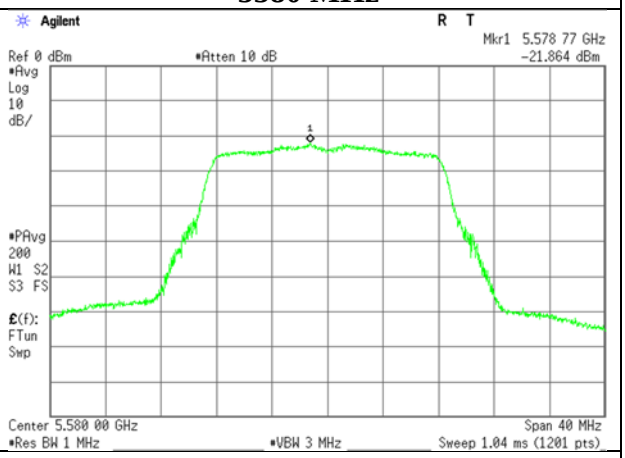
5500 MHz



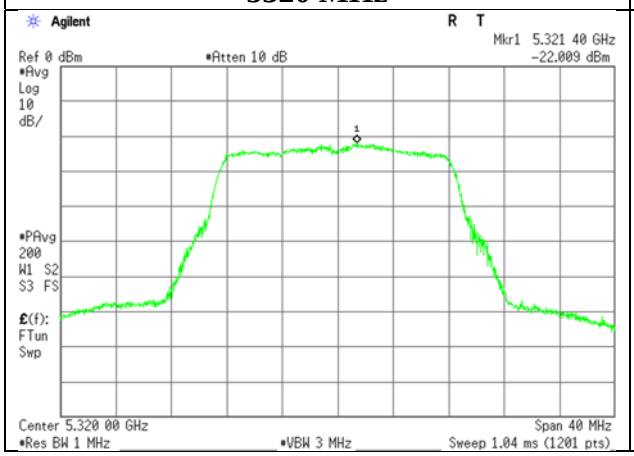
5300 MHz



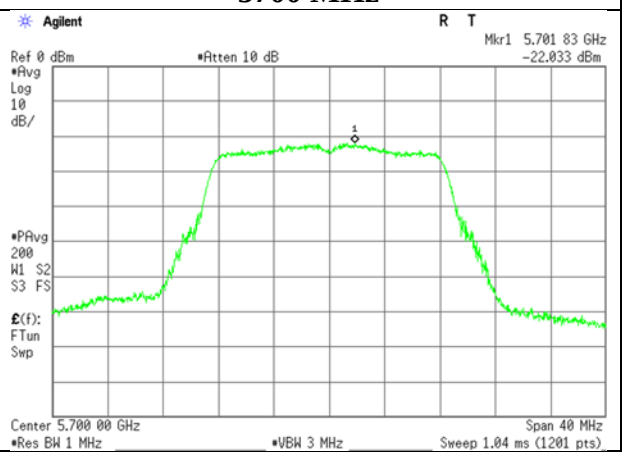
5580 MHz



5320 MHz



5700 MHz

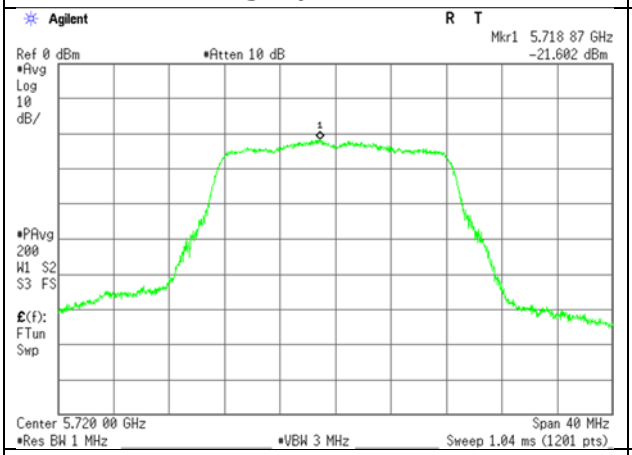


Maximum Power Spectral Density

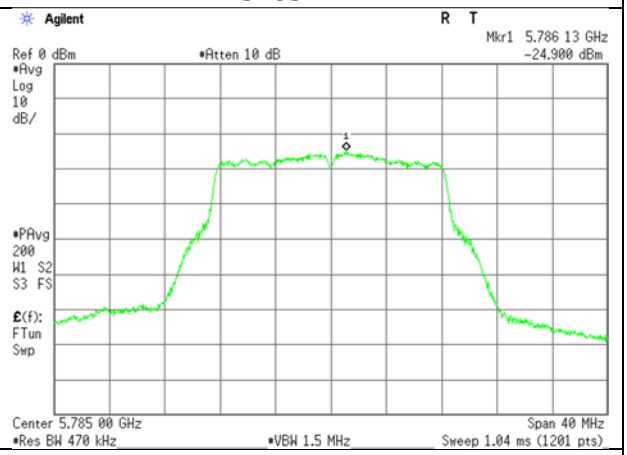
Report No.	13395143H
Test place	Ise EMC Lab. No.4 Measurement Room
Date	June 16, 2020
Temperature / Humidity	22 deg. C / 52 % RH
Engineer	Junki Nagatomi
Mode	Tx 11a

11a, Antenna 1

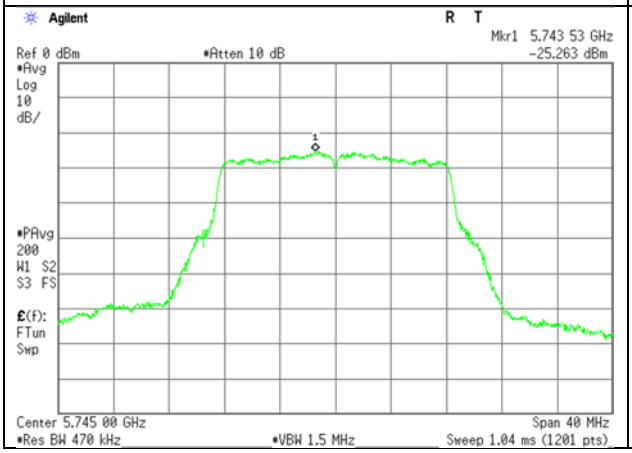
5720 MHz



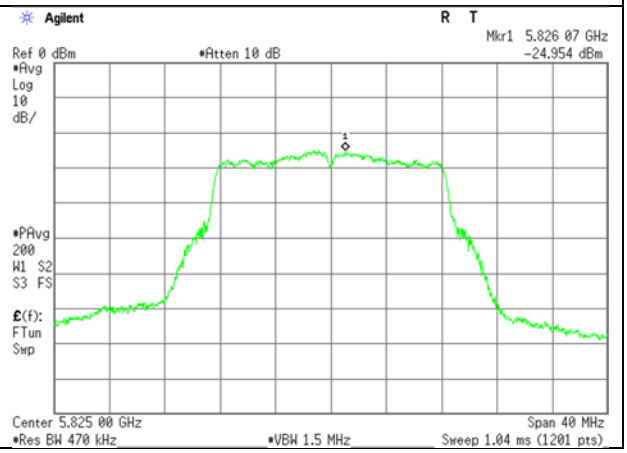
5785 MHz



5745 MHz



5825 MHz

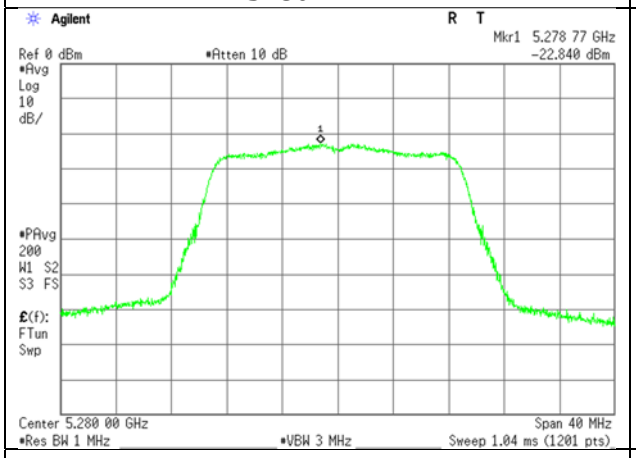


Maximum Power Spectral Density

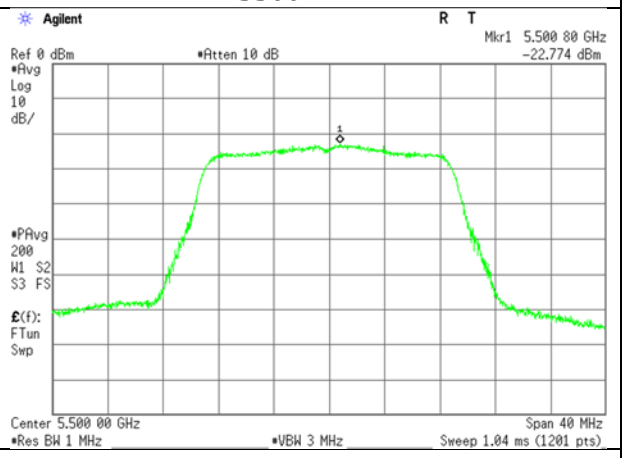
Report No.	13395143H
Test place	Ise EMC Lab. No.4 Measurement Room
Date	June 16, 2020
Temperature / Humidity	22 deg. C / 52 % RH
Engineer	Junki Nagatomi
Mode	Tx 11n-20

11n-20, Antenna 1

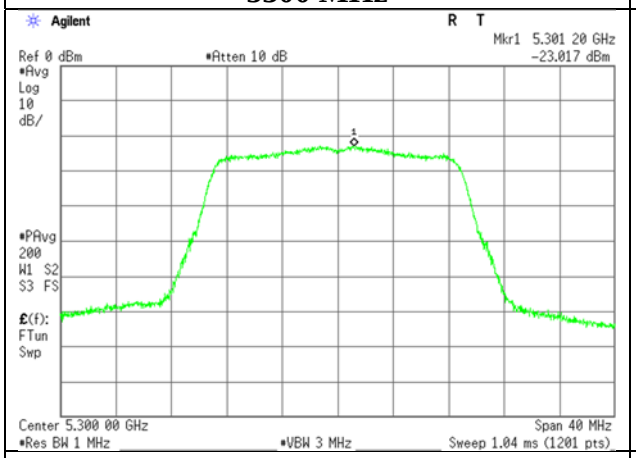
5280 MHz



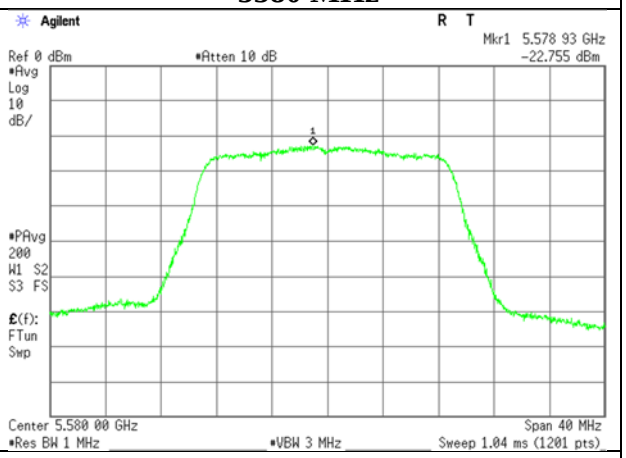
5500 MHz



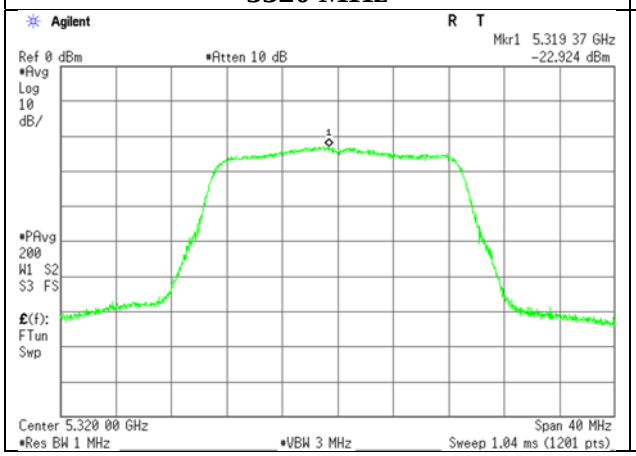
5300 MHz



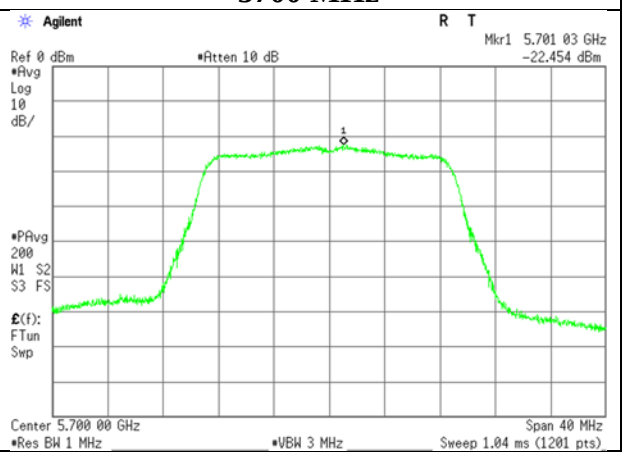
5580 MHz



5320 MHz



5700 MHz

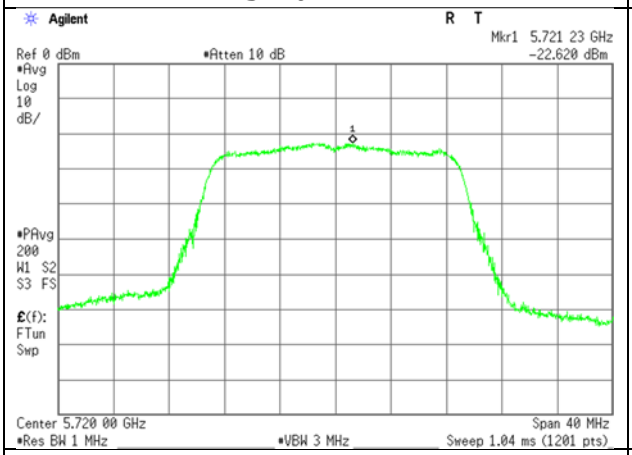


Maximum Power Spectral Density

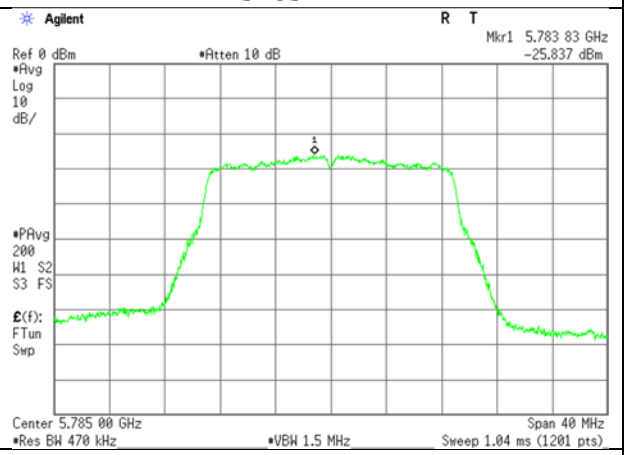
Report No.	13395143H
Test place	Ise EMC Lab. No.4 Measurement Room
Date	June 16, 2020
Temperature / Humidity	22 deg. C / 52 % RH
Engineer	Junki Nagatomi
Mode	Tx 11n-20

11n-20, Antenna 1

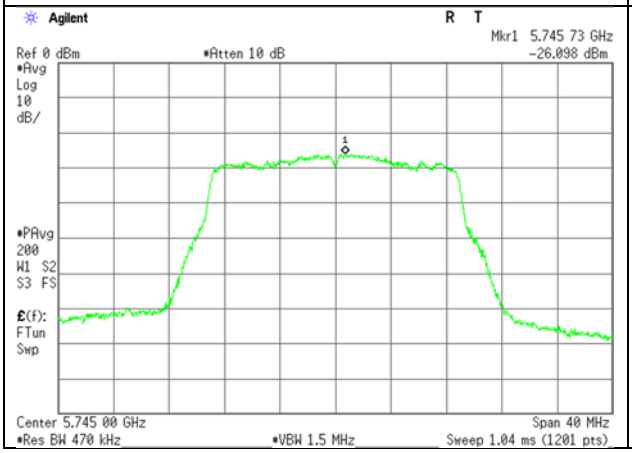
5720 MHz



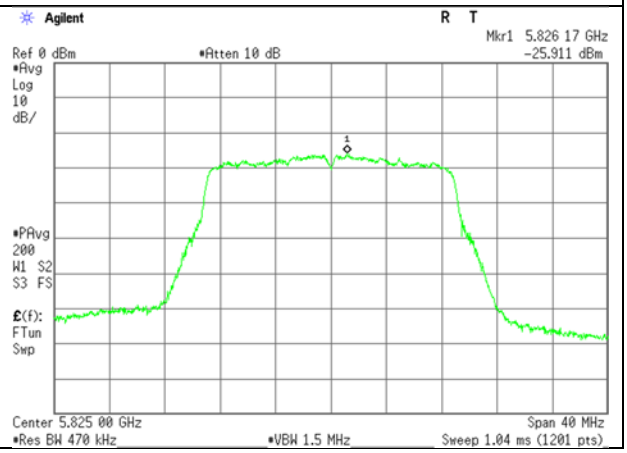
5785 MHz



5745 MHz



5825 MHz

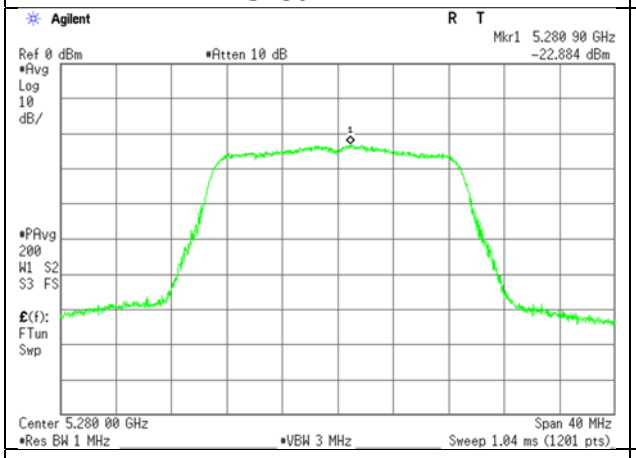


Maximum Power Spectral Density

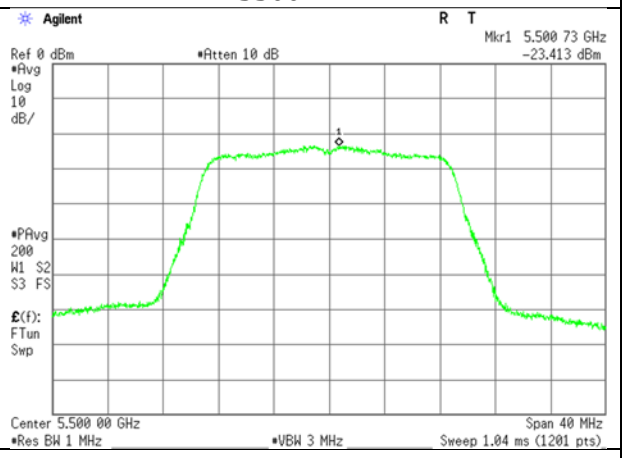
Report No.	13395143H
Test place	Ise EMC Lab. No.4 Measurement Room
Date	June 16, 2020
Temperature / Humidity	22 deg. C / 52 % RH
Engineer	Junki Nagatomi
Mode	Tx 11ac-20

11ac-20, Antenna 1

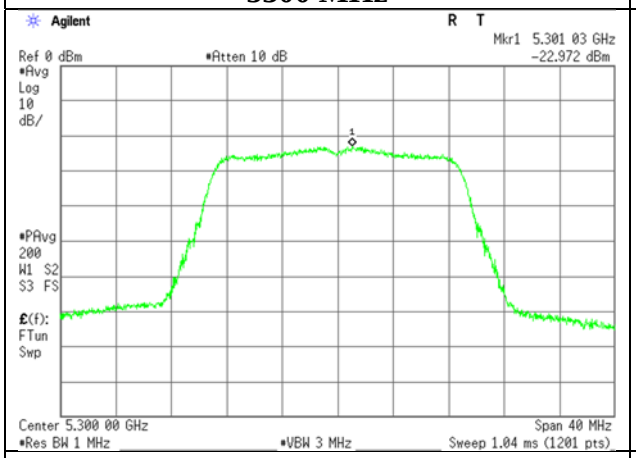
5280 MHz



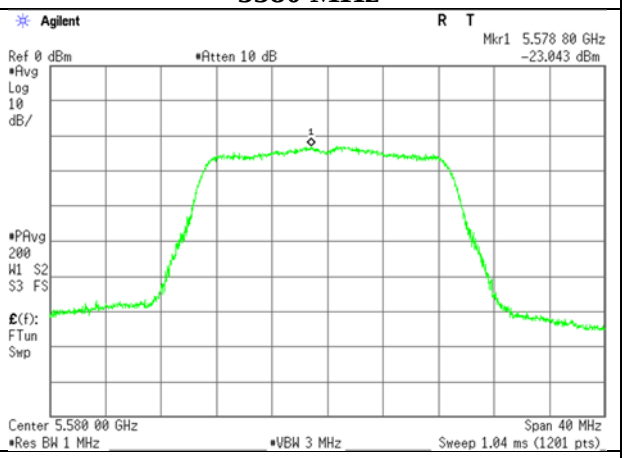
5500 MHz



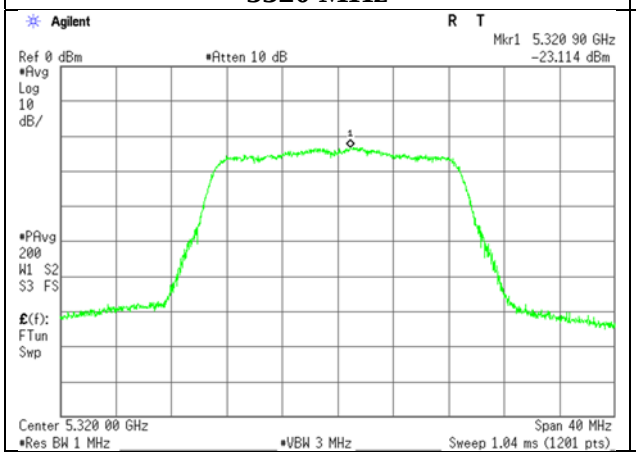
5300 MHz



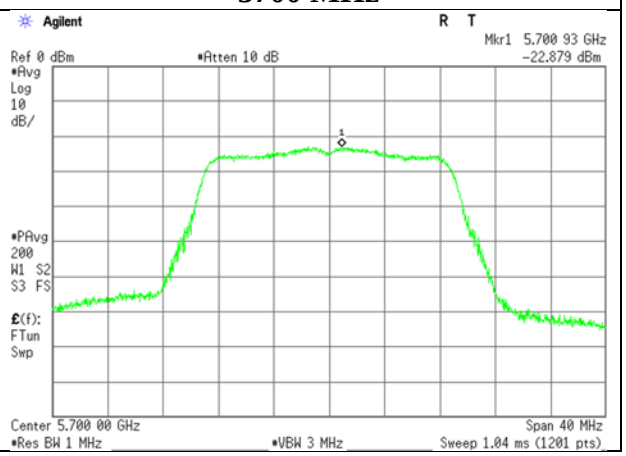
5580 MHz



5320 MHz



5700 MHz

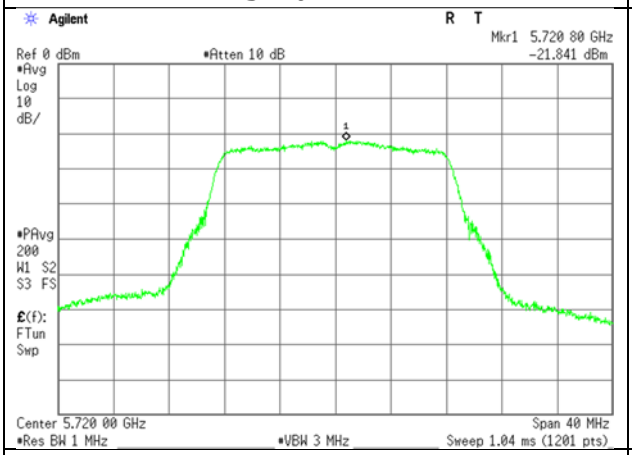


Maximum Power Spectral Density

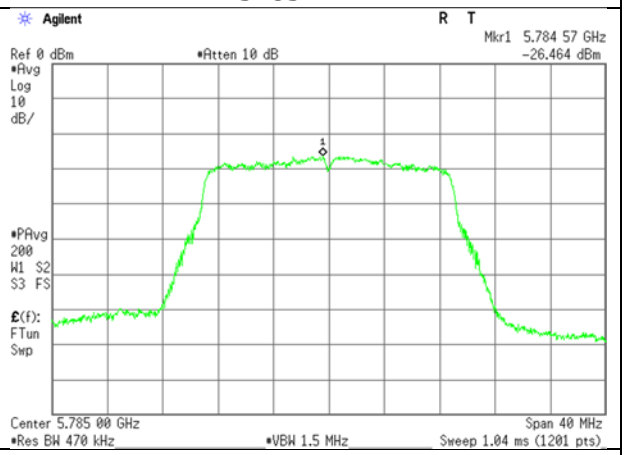
Report No.	13395143H
Test place	Ise EMC Lab. No.4 Measurement Room
Date	June 16, 2020
Temperature / Humidity	22 deg. C / 52 % RH
Engineer	Junki Nagatomi
Mode	Tx 11ac-20

11ac-20, Antenna 1

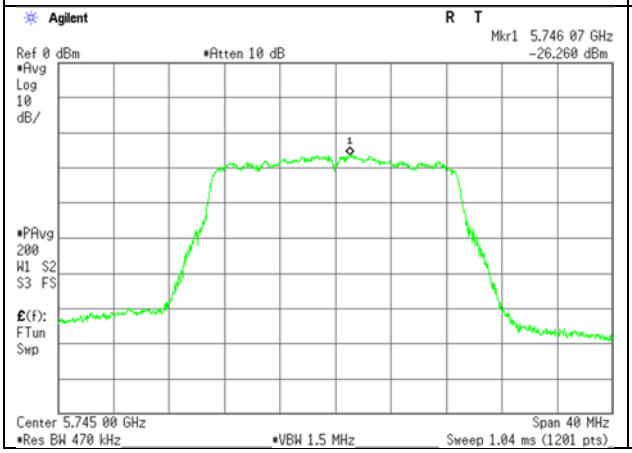
5720 MHz



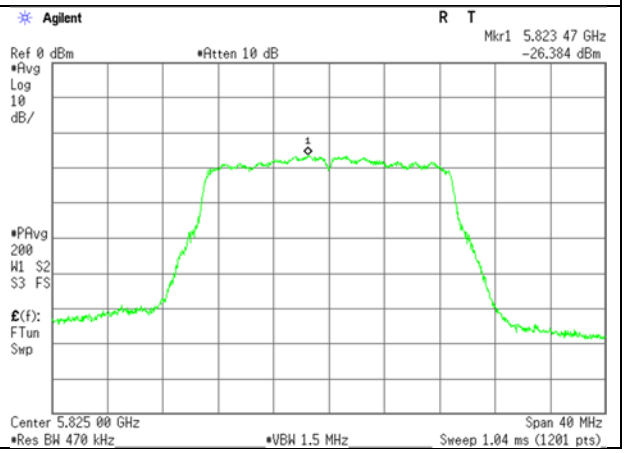
5785 MHz



5745 MHz



5825 MHz

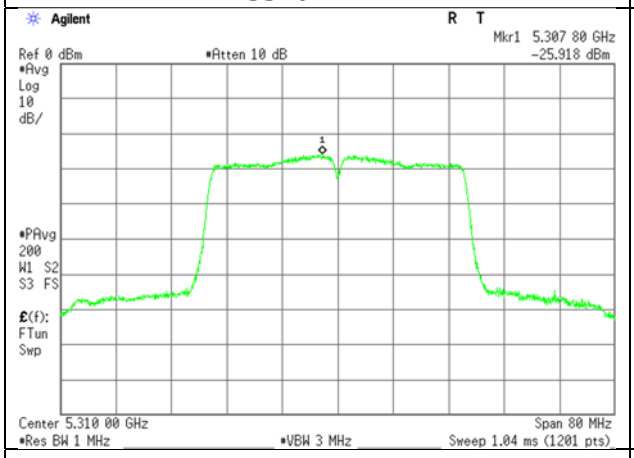


Maximum Power Spectral Density

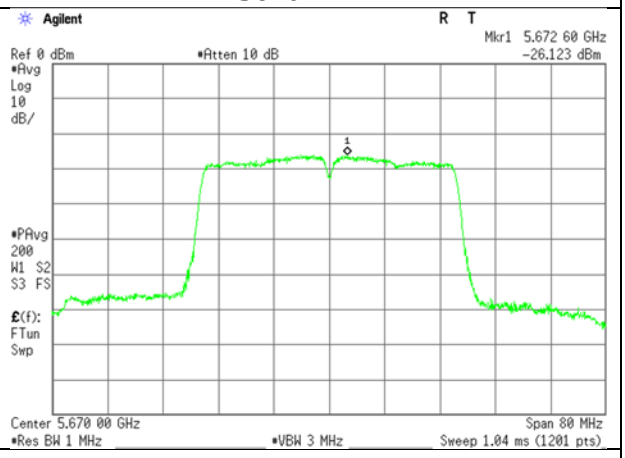
Report No.	13395143H
Test place	Ise EMC Lab. No.4 Measurement Room
Date	June 16, 2020
Temperature / Humidity	22 deg. C / 52 % RH
Engineer	Junki Nagatomi
Mode	Tx 11n-40

11n-40, Antenna 1

5310 MHz



5670 MHz



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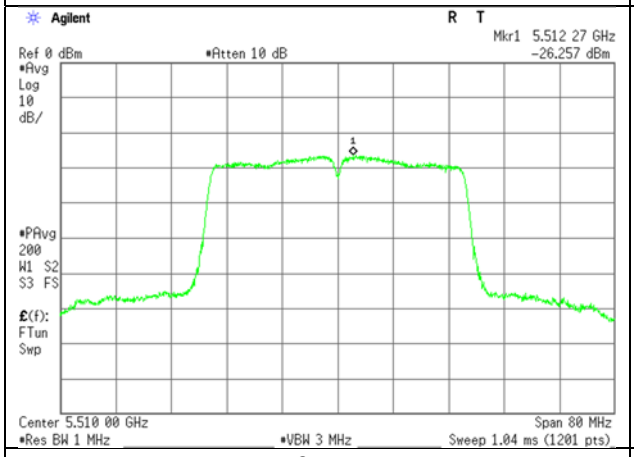
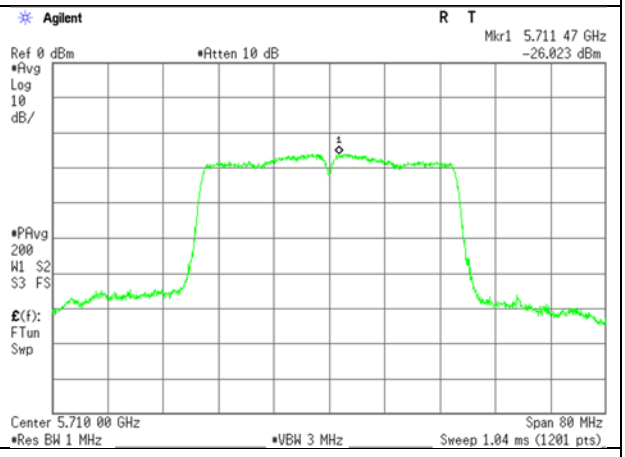


5710 MHz



5550 MHz