

RADIO TEST REPORT

Test Report No. 14926560S-F-R2

Customer	KONICA MINOLTA, INC.
Description of EUT	SKR 3000
Model Number of EUT	P-53
FCC ID	YR7SKR3000P9
Test Regulation	FCC Part 15 Subpart E
Test Result	Complied
Issue Date	July 3, 2024
Remarks	WLAN (5 GHz band) part Except for DFS test

Representative Test EngineerHiromasa Sato
Engineer**Approved By**Toyokazu Imamura
Engineer

CERTIFICATE 1266.03

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

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- The information provided from the customer for this report is identified in Section 1.
- For test report(s) referred in this report, the latest version (including any revisions) is always referred.

REVISION HISTORY

Original Test Report No. 14926560S-F

This report is a revised version of 14926560S-F-R1. 14926560S-F-R1 is replaced with this report .

Revision	Test Report No.	Date	Page Revised Contents
- (Original)	14926560S-F	March 1, 2024	-
1	14926560S-F-R1	June 27, 2024	P.5 Update of test date: From November 8 to November 21, 2023 to November 8, 2023 to June 21, 2024 P.10 Corrected Radiated Spurious Emission (Below 1 GHz) and Conducted Spurious Emission measurement mode from 11n-20 5580 MHz to 11n-20 5220 MHz P.76 Added 11n-20 5220 MHz results P.82 Removed results below 1 GHz for 11n-20 5580 MHz P.88 Modified tested frequency range: "26.5 GHz to GHz" =>"26.5 GHz to 40 GHz" P.90 Plot data was replaced with 11n-20 5220 MHz. P.91 Replaced tested frequency and data on Conducted Spurious Emission: "11n-20 5580 MHz" => "11n-20 5220 MHz" P.92 Add equipment used below 1 GHz P.93 Corrected measured photo below 1 GHz: From 3AC to 1AC
2	14926560S-F-R2	July 3, 2024	P.16 Added Conducted Spurious Emission P.76 Deleted old test date for above 1 GHz

Reference: Abbreviations (Including words undescribed in this report)

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

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SECTION 1: Customer Information

Company Name	KONICA MINOLTA, INC.
Address	1 Sakura-machi, Hino-shi, Tokyo, 191-8511, Japan
Telephone Number	+81-42-589-8429
Contact Person	Ken Nagami

The information provided by the customer is as follows;

- Customer, Description 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 and Test Date
- SECTION 4: Operation of EUT during testing

SECTION 2: Equipment Under Test (EUT)

2.1 Identification of EUT

Description	SKR 3000
Model Number	P-53
Serial Number	Refer to SECTION 4.2
Condition	Engineering prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification	No Modification by the test lab
Receipt Date	October 27 and November 3, 2023
Test Date	November 8, 2023 to June 21, 2024

2.2 Product Description

General Specification

Rating	DC 15 V
Operating temperature	10 deg. C to 35 deg. C

Radio Specification

This report contains data provided by the customer which can impact the validity of results. UL Japan, Inc. is only responsible for the validity of results after the integration of the data provided by the customer. The data provided by the customer is marked "a)" in the table below.

	IEEE802.11b	IEEE802.11g	IEEE802.11a	IEEE802.11n (20 M band)
Frequency of operation	2412 MHz - 2462 MHz	2412 MHz - 2462 MHz	5180 MHz - 5240 MHz 5260 MHz - 5320 MHz 5500 MHz - 5700 MHz 5745 MHz - 5825 MHz	2412 MHz - 2462 MHz 5180 MHz - 5240 MHz 5260 MHz - 5320 MHz 5500 MHz - 5700 MHz 5745 MHz - 5825 MHz
Type of modulation	DSSS (CCK, DQPSK, DBPSK)	OFDM-CCK (64QAM, 16QAM, QPSK, BPSK)	OFDM (64QAM, 16QAM, QPSK, BPSK)	
Channel spacing	5 MHz		20 MHz	5 MHz (2.4 GHz band) 20 MHz (5 GHz band)
Antenna Type	[Main Antenna (ANTENNA 1)/Sub Antenna (ANTENNA 2)] PIFA (Planar Inverted F Antenna)			
Antenna gain ^{a)}	[Main Antenna (ANTENNA 1)] -1.95 dBi (2.4 GHz Band), -0.98 dBi (5 GHz Band)			
	[Sub Antenna (ANTENNA 2)] -2.21 dBi (2.4 GHz Band), -1.54 dBi (5 GHz Band)			
Antenna Connector type	[Main Antenna (ANTENNA 1)/Sub Antenna (ANTENNA 2)] Connector PCB side: U.FL, Antenna side: Soldered			

SECTION 3: Test specification, Procedures & Results

3.1 Test Specification

Test Specification	FCC Part 15 Subpart E The latest version on the first day of the testing period
Title	FCC 47 CFR Part 15 Radio Frequency Device Subpart E Unlicensed National Information Infrastructure Devices Section 15.407 General technical requirements

3.2 Procedures and Results

Item	Test Procedure	Specification	Worst Margin	Results	Remarks
Conducted Emission	FCC: ANSI C63.10-2013 ISED: RSS-Gen 8.8	FCC: 15.407 (b) (6) / 15.207 ISED: RSS-Gen 8.8	-	N/A	*1)
26 dB Emission Bandwidth	FCC: KDB Publication Number 789033 ISED: -	FCC: 15.407 (a) (1) (2) (3) ISED: -	See data	Complied	Conducted
Maximum Conducted Output Power	FCC: KDB Publication Number 789033 ISED: -	FCC: 15.407 (a) (1) (2) (3) ISED: RSS-247 6.2.1.1 6.2.2.1 6.2.3.1 6.2.4.1		Complied	Conducted
Maximum Power Spectral Density	FCC: KDB Publication Number 789033 ISED: -	FCC: 15.407 (a) (1) (2) (3) ISED: RSS-247 6.2.1.1 6.2.2.1 6.2.3.1 6.2.4.1		Complied	Conducted
Spurious Emission Restricted Band Edge	FCC: ANSI C63.10-2013 KDB Publication Number 789033 ISED: -	FCC: 15.407 (b), 15.205 and 15.209 ISED: RSS-247 6.2.1.2 6.2.2.2 6.2.3.2 6.2.4.2	7.2 dB 5460.000 MHz, AV, Hori., Tx 11n-20 5500 MHz (SDM)	Complied	Conducted (< 30 MHz) / Radiated (> 30 MHz) *2)
6 dB Emission Bandwidth	FCC: ANSI C63.10-2013 ISED: -	FCC: 15.407 (e) ISED: RSS-247 6.2.4.1	See data	Complied	Conducted
Note: UL Japan, Inc.'s EMI Work Procedures: Work Instructions-ULID-003591 and Work Instructions-ULID-003593. * In case any questions arise about test procedure, ANSI C63.10: 2013 is also referred. *1) The EUT operates with a battery. AC Line can be connected to the EUT via PC; however, the EUT stops transmission during recharging. Therefore, the test is not applicable to the EUT. *2) Radiated test was selected over 30 MHz based on RSS-247 6.2 and KDB 789033 D02 G.3.b).					

FCC Part 15.31 (e)

This EUT provides the stable voltage constantly to RF Module regardless of input voltage.
Therefore, this 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	-	Conducted

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

3.4 Uncertainty

Measurement uncertainty is not taken into account when stating conformity with a specified requirement.

Note: When margins obtained from test results are less than the measurement uncertainty, the test results may exceed the limit.

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

Item	Frequency range	Uncertainty (+/-)
Conducted Emission (AC Mains) LISN	150 kHz to 30 MHz	3.2 dB
Radiated Emission (Measurement distance: 3 m)	9 kHz to 30 MHz	3.3 dB
	30 MHz to 200 MHz	4.9 dB
	200 MHz to 1 GHz	6.2 dB
	1 GHz to 6 GHz	4.7 dB
	6 GHz to 18 GHz	5.3 dB
	18 GHz to 40 GHz	5.5 dB
Radiated Emission (Measurement distance: 1 m)	1 GHz to 18 GHz	5.6 dB
	18 GHz to 40 GHz	5.8 dB

Antenna terminal test	Uncertainty (+/-)
Power Measurement above 1 GHz (Average Detector) SPM-06	1.1 dB
Power Measurement above 1 GHz (Peak Detector) SPM-06	1.8 dB
Power Measurement above 1 GHz (Average Detector) SPM-07	1.0 dB
Power Measurement above 1 GHz (Peak Detector) SPM-07	1.2 dB
Power Measurement above 1 GHz (Average Detector) SPM-13	0.81 dB
Power Measurement above 1 GHz (Peak Detector) SPM-13	1.1 dB
Spurious Emission (Conducted) below 1 GHz	0.91 dB
Conducted Emissions Power Density Measurement 1 GHz to 3 GHz	1.3 dB
Conducted Emissions Power Density Measurement 3 GHz to 18 GHz	2.5 dB
Spurious Emission (Conducted) 18 GHz to 26.5 GHz	2.8 dB
Spurious Emission (Conducted) 26.5 GHz to 40 GHz	2.6 dB
Bandwidth Measurement	0.012 %
Duty Cycle and Time Measurement	0.27 %
Temperature_SCH-01	0.96 deg.C.
Humidity_SCH-01	4.0 %
Temperature_SCH-02	2.2 deg.C.
Voltage	0.74 %

3.5 Test Location

UL Japan, Inc. Shonan EMC Lab.

1-22-3, Megumigaoka, Hiratsuka-shi, Kanagawa-ken 259-1220 Japan

Telephone: +81-463-50-6400

A2LA Certificate Number: 1266.03

(FCC test firm registration number: 626366, ISED lab company number: 2973D / CAB identifier: JP0001)

Test room	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Maximum measurement distance
No.1 Semi-anechoic chamber (SAC1)	20.6 x 11.3 x 7.65	20.6 x 11.3	10 m
No.2 Semi-anechoic chamber (SAC2)	20.6 x 11.3 x 7.65	20.6 x 11.3	10 m
No.3 Semi-anechoic chamber (SAC3)	12.7 x 7.7 x 5.35	12.7 x 7.7	5 m
No.4 Semi-anechoic chamber (SAC4)	8.1 x 5.1 x 3.55	8.1 x 5.1	-
Wireless anechoic chamber 1 (WAC1)	9.5 x 6.0 x 5.4	9.5 x 6.0	3 m
Wireless anechoic chamber 2 (WAC2)	9.5 x 6.0 x 5.4	9.5 x 6.0	3 m
No.1 Shielded room	6.8 x 4.1 x 2.7	6.8 x 4.1	-
No.2 Shielded room	6.8 x 4.1 x 2.7	6.8 x 4.1	-
No.3 Shielded room	6.3 x 4.7 x 2.7	6.3 x 4.7	-
No.4 Shielded room	4.4 x 4.7 x 2.7	4.4 x 4.7	-
No.5 Shielded room	7.8 x 6.4 x 2.7	7.8 x 6.4	-
No.6 Shielded room	7.8 x 6.4 x 2.7	7.8 x 6.4	-
No.8 Shielded room	3.45 x 5.5 x 2.4	3.45 x 5.5	-
No.1 Measurement room	2.55 x 4.1 x 2.5	-	-
No.2 Measurement room	4.5 x 3.5 x 2.5	-	-
Wireless shielded room 1	3.0 x 4.5 x 2.7	3.0 x 4.5	-
Wireless shielded room 2	3.0 x 4.5 x 2.7	3.0 x 4.5	-

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)

Mode	Remarks*	Power Setting (dBm)
IEEE 802.11a (11a)	12 Mbps, PN9	6.5
IEEE 802.11n SISO 20 MHz BW (11n-20)	MCS 6 (1 Streams), PN9	6.5
IEEE 802.11n SDM 20 MHz BW (11n-20)	MCS 15 (2 Streams), PN9	6.5
*The worst antenna (Ant: 1) and condition was determined based on the test result of Maximum Conducted Output Power.		
*Power of the EUT was set by the software as follows; Power Setting: Refer to the above table Software: Refer to the below table		
*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.		
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.		

Software name	Version	Released Date	Storage location
Panel Firmware	V5.00R00_004	2023/7/7	EUT memory (* operated by connected host PC)
Qualcomm Radio Control Tool	4.0.00125	2019/03/25 11:37:18	Connected host PC

*The Details of Operation Mode(s)

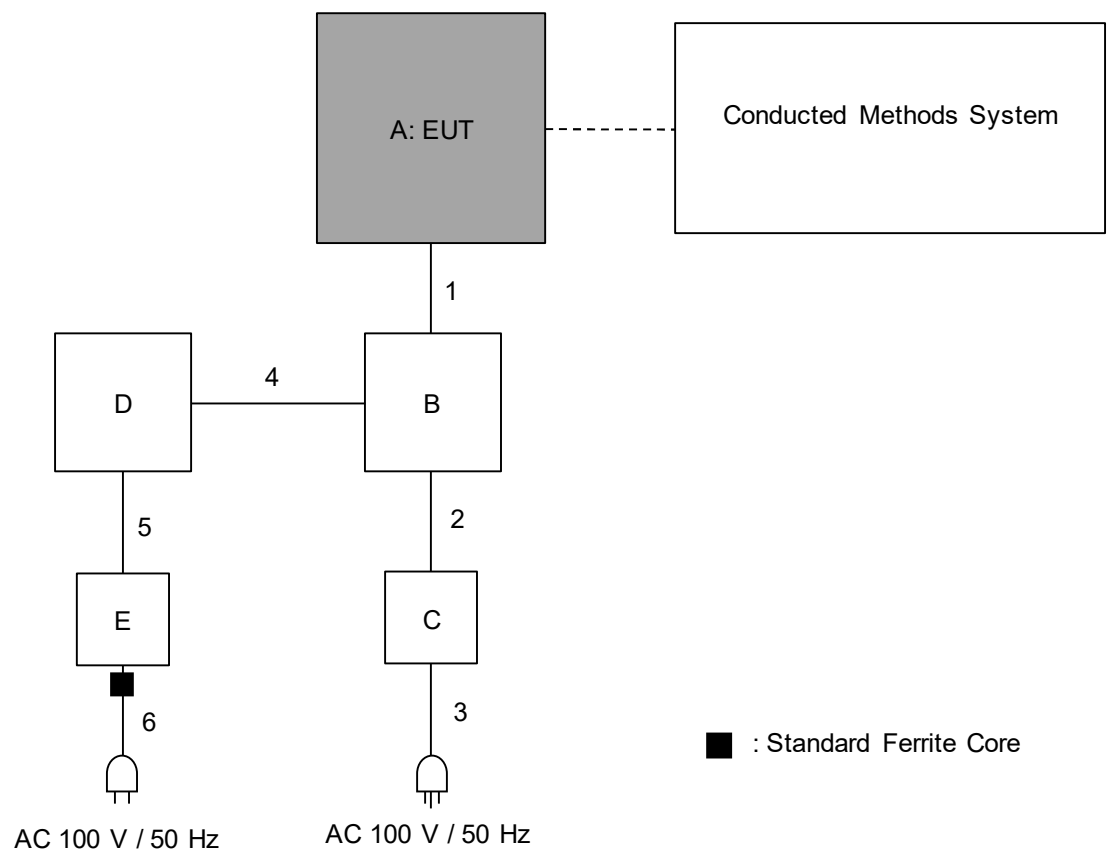
Test Item	Operating Mode	Tested Antenna	Tested Frequency			
			Lower Band	Middle Band	Additional Band	Upper Band
26 dB Emission Bandwidth	Tx 11a (SISO) Tx 11n-20 (SISO) Tx 11n-20 (SDM)	1 *2)	-	5260 MHz 5300 MHz 5320 MHz	5500 MHz 5580 MHz 5700 MHz	-
99 % Occupied Bandwidth	Tx 11a (SISO) Tx 11n-20 (SISO) Tx 11n-20 (SDM)	1 *2)	5180 MHz 5220 MHz 5240 MHz	5260 MHz 5300 MHz 5320 MHz	5500 MHz 5580 MHz 5700 MHz	5745 MHz 5785 MHz 5825 MHz
Maximum Conducted Output Power, Maximum Power Spectral Density	Tx 11a (SISO) Tx 11n-20 (SISO)	1 *2)	5180 MHz 5220 MHz 5240 MHz	5260 MHz 5300 MHz 5320 MHz	5500 MHz 5580 MHz 5700 MHz	5745 MHz 5785 MHz 5825 MHz
	Tx 11n-20 (SDM)	1+2	5180 MHz 5220 MHz 5240 MHz	5260 MHz 5300 MHz 5320 MHz	5500 MHz 5580 MHz 5700 MHz	5745 MHz 5785 MHz 5825 MHz
6 dB Bandwidth	Tx 11a Tx 11n-20 (SISO) Tx 11n-20 (SDM)	1 *2)	-	-	-	5745 MHz 5785 MHz 5825 MHz
Radiated Spurious Emission (Below 1 GHz)	Tx 11n-20 (SDM) *1)	1+2	5220 MHz	-	-	-
Radiated Spurious Emission (Above 1 GHz)	Tx 11a	1 *2)	5180 MHz 5240 MHz	5320 MHz	5500 MHz 5580 MHz 5700 MHz	5745 MHz 5785 MHz 5825 MHz
	Tx 11n-20 (SDM)	1+2	5180 MHz 5220 MHz 5240 MHz	5320 MHz	5500 MHz 5580 MHz 5700 MHz	5745 MHz 5785 MHz 5825 MHz
Conducted Spurious Emission	Tx 11n-20 (SDM) *1)	1 *2)	5220 MHz	-	-	-

*1) The mode was tested as a representative, because it had the highest power at antenna terminal test.

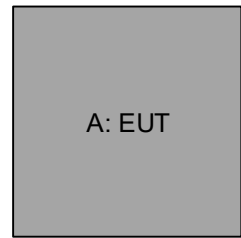
*2) The test was performed with the antenna that had higher power as a representative.

4.2 Configuration and Peripherals

Antenna Terminal conducted test



Radiated Emission test



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

Description of EUT and Support Equipment

No.	Item	Model number	Serial Number	Manufacturer	Remarks
A	SKR 3000	P-53	AEA0-S0002 *1) AEA0-S0003 *2)	KONICA MINOLTA, INC.	EUT
B	Detector Interface Unit	SKR 3000/G-21	A9G5-09147	KONICA MINOLTA, INC.	-
C	DI Unit AC Adapter	SKR 3000/G-22	A967-05205	KONICA MINOLTA, INC.	-
D	Laptop Computer	PC-VJ23LLZGR	66000071A	NEC	-
E	AC Adapter	ADLX45DLC2A	8SSA10E7592L1CZ75 Z0W0R	Lenovo	-

*1) Used for Radiated Spurious Emission and Band Edge Compliance Test.

*2) Used for Antenna Terminal Conducted Tests.

List of Cables Used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	IO cable	8.0	Shielded	Shielded	-
2	DC cable	1.3	Unshielded	Unshielded	-
3	AC cable	3.0	Unshielded	Unshielded	-
4	LAN cable	3.0	Unshielded	Unshielded	-
5	DC cable	1.6	Unshielded	Unshielded	-
6	AC cable	0.9	Unshielded	Unshielded	-

SECTION 5: Radiated Spurious Emission and Band Edge Compliance

Test Procedure

< Below 1 GHz >

EUT was placed on a urethane platform of nominal size, 0.5 m by 0.5 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 1 GHz >

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. 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 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.

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 1 GHz >

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

< Above 1 GHz >

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:

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

Test Antennas are used as below;

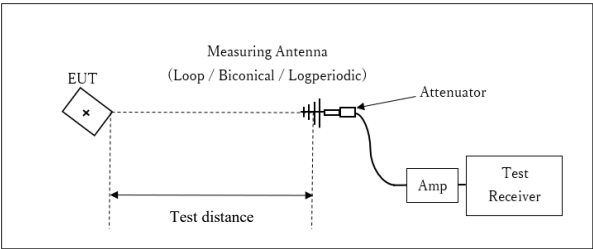
Frequency	30 MHz to 200 MHz	200 MHz to 1 GHz	Above 1 GHz
Antenna Type	Biconical	Logperiodic	Horn

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 VB *1) RBW: 1 MHz VBW: 1/T Detector: Peak

*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

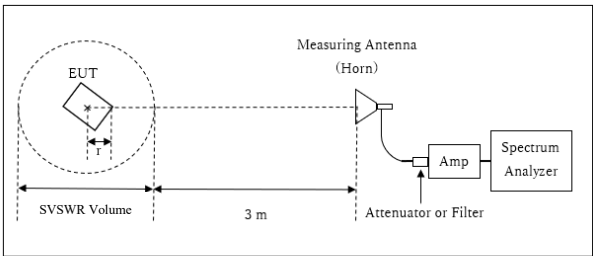
Below 1 GHz



x : Center of turn table

Test Distance: 3 m

1 GHz to 10 GHz

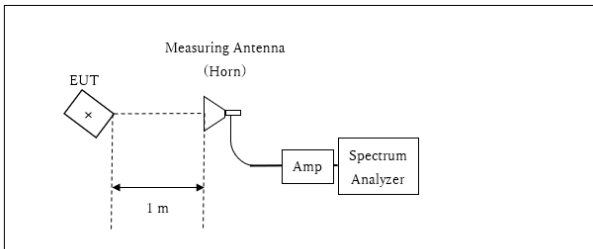


r : Radius of an outer periphery of EUT
x : Center of turn table

Distance Factor: $20 \times \log (3.7 \text{ m} / 3.0 \text{ m}) = 1.83 \text{ dB}$
* Test Distance: $(3 + \text{SVSWR Volume} / 2) - r = 3.7 \text{ m}$

SVSWR Volume : 2.0 m
(SVSWR Volume has been calibrated based on CISPR 16-1-4.)
 $r = 0.3 \text{ m}$

10 GHz to 40 GHz



x : Center of turn table

Distance Factor: $20 \times \log (1.0 \text{ m} / 3.0 \text{ m}) = -9.54 \text{ dB}$
*Test Distance: 1 m

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

Module SISO

Antenna polarization	Carrier	Spurious (30 MHz to 1 GHz)	Spurious (1 GHz to 6.5 GHz)	Spurious (6.5 GHz to 10 GHz)	Spurious (Above 10 GHz)
Horizontal	Y	Y	Y	Y	X
Vertical	X	Y	X	X	X

Module SDM

Antenna polarization	Carrier	Spurious (30 MHz to 1 GHz)	Spurious (1 GHz to 6.5 GHz)	Spurious (6.5 GHz to 10 GHz)	Spurious (Above 10 GHz)
Horizontal	Y	Y	Y	Y	X
Vertical	X	Y	X	X	X

Test results are rounded off and limit are rounded down, so some differences might be observed.

Measurement Range : 30 MHz to 40 GHz
Test Data : APPENDIX
Test Result : Pass

SECTION 6: 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: 160 MHz BW) (Method PM-G)
Maximum Power Spectral Density	Encompass the entire EBW	1 MHz or 100 kHz *2)	≥ 3 RBW	Auto	RMS Power Averaging (200 times)	Clear Write	Spectrum Analyzer
Conducted Spurious Emission*3) *4)	9 kHz to 150 kHz 150 kHz to 30 MHz	200 Hz 10 kHz	620 Hz 30 kHz	Auto	Peak	Max Hold	Spectrum Analyzer

*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 to 5.850 GHz, but it is not possible with spectrum analyzer, so RBW Correction Factor ($10 \log (500 \text{ kHz} / 100 \text{ kHz})$) 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 to 150 kHz: RBW = 200 Hz, 150 kHz to 30 MHz: RBW = 10 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 Ohms. 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.

Test results are rounded off and limit are rounded down, 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

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Shonan EMC Lab. No.5 Shielded Room
Date November 15, 2023
Temperature / Humidity 25 deg. C / 36 % RH
Engineer Kouki Yamada
Mode Tx

11a (SISO)

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Antenna 1	5180	-	16554.6
	5220	-	16586.2
	5240	-	16559.9
	5260	19.360	16549.7
	5300	19.293	16517.3
	5320	19.835	16553.6
	5500	19.116	16533.8
	5580	19.114	16559.4
	5700	19.652	16606.8
	5745	-	16583.5
	5785	-	16579.2
	5825	-	16550.0

11n-20 (SISO)

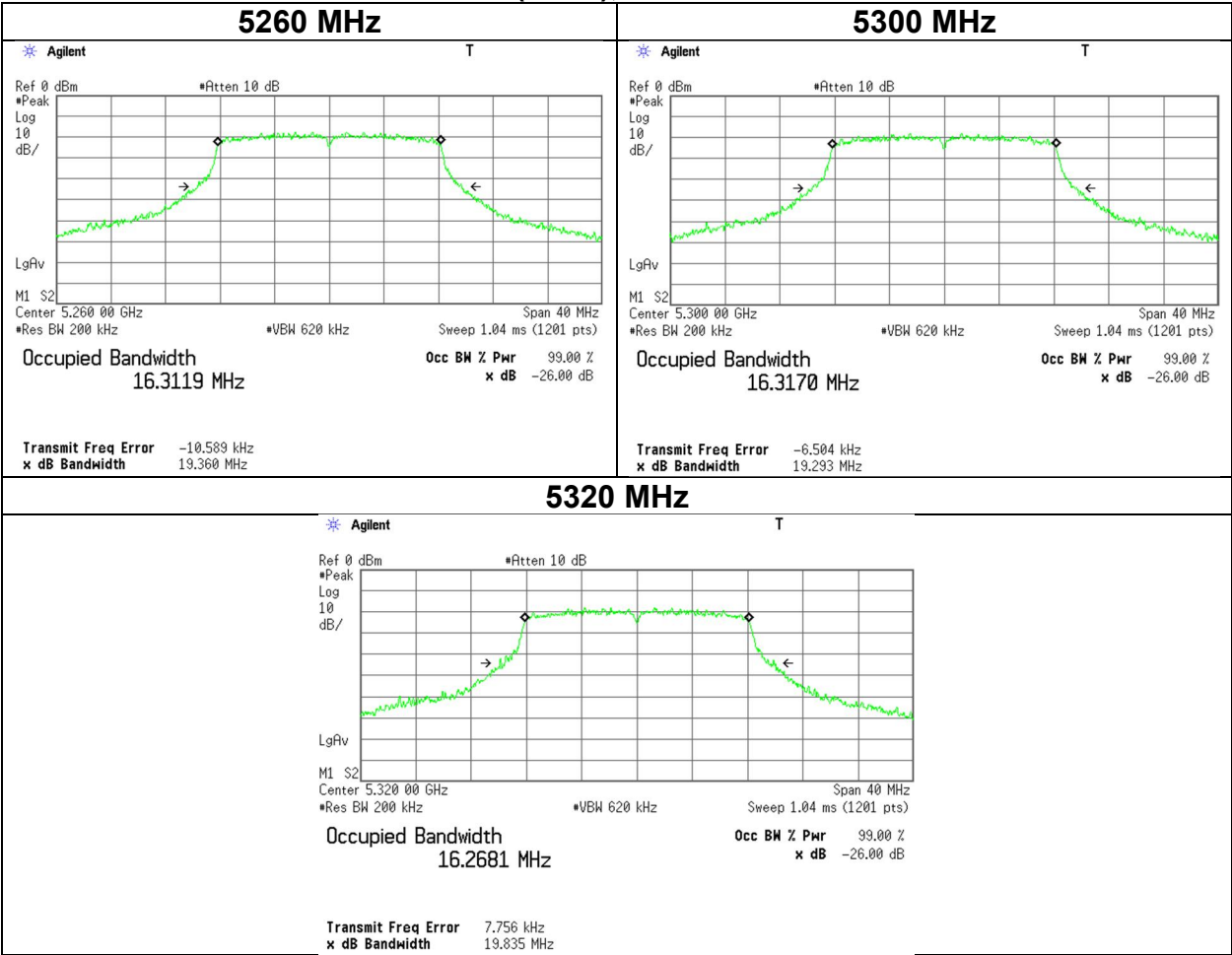
Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Antenna 1	5180	-	18049.2
	5220	-	18119.5
	5240	-	18091.8
	5260	21.486	18093.9
	5300	21.569	18049.6
	5320	21.584	18088.4
	5500	21.702	18072.4
	5580	21.854	18078.0
	5700	21.267	18086.0
	5745	-	18095.1
	5785	-	18056.3
	5825	-	18097.9

11n-20 (SDM)

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Antenna 1	5180	-	18076.8
	5220	-	18061.8
	5240	-	18013.1
	5260	21.715	18019.1
	5300	21.726	18115.6
	5320	21.477	18073.4
	5500	21.391	18077.5
	5580	21.549	18037.9
	5700	21.211	18052.7
	5745	-	17995.5
	5785	-	18033.0
	5825	-	17984.7

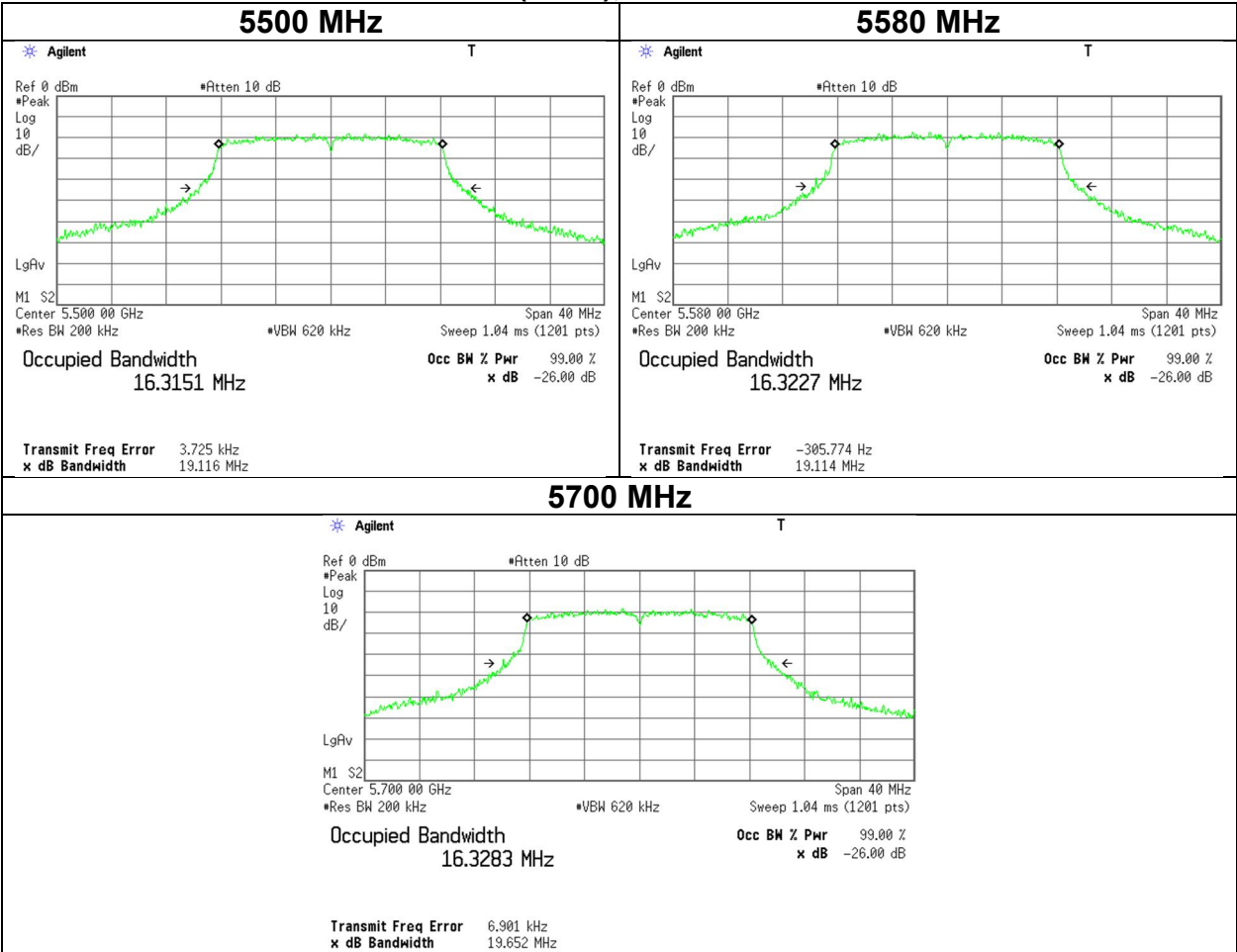
26 dB Emission Bandwidth

11a (SISO), Antenna 1



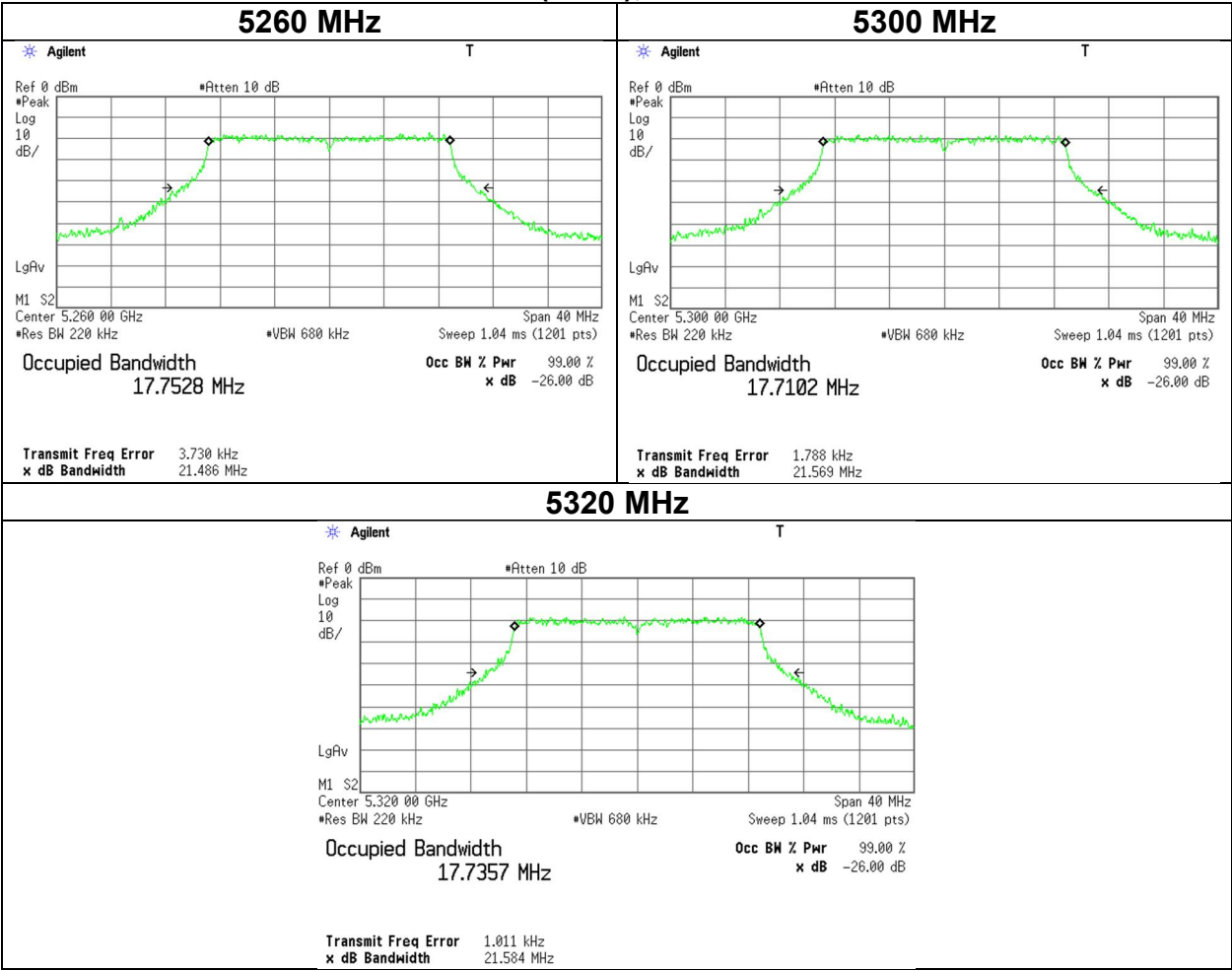
26 dB Emission Bandwidth

11a (SISO), Antenna 1



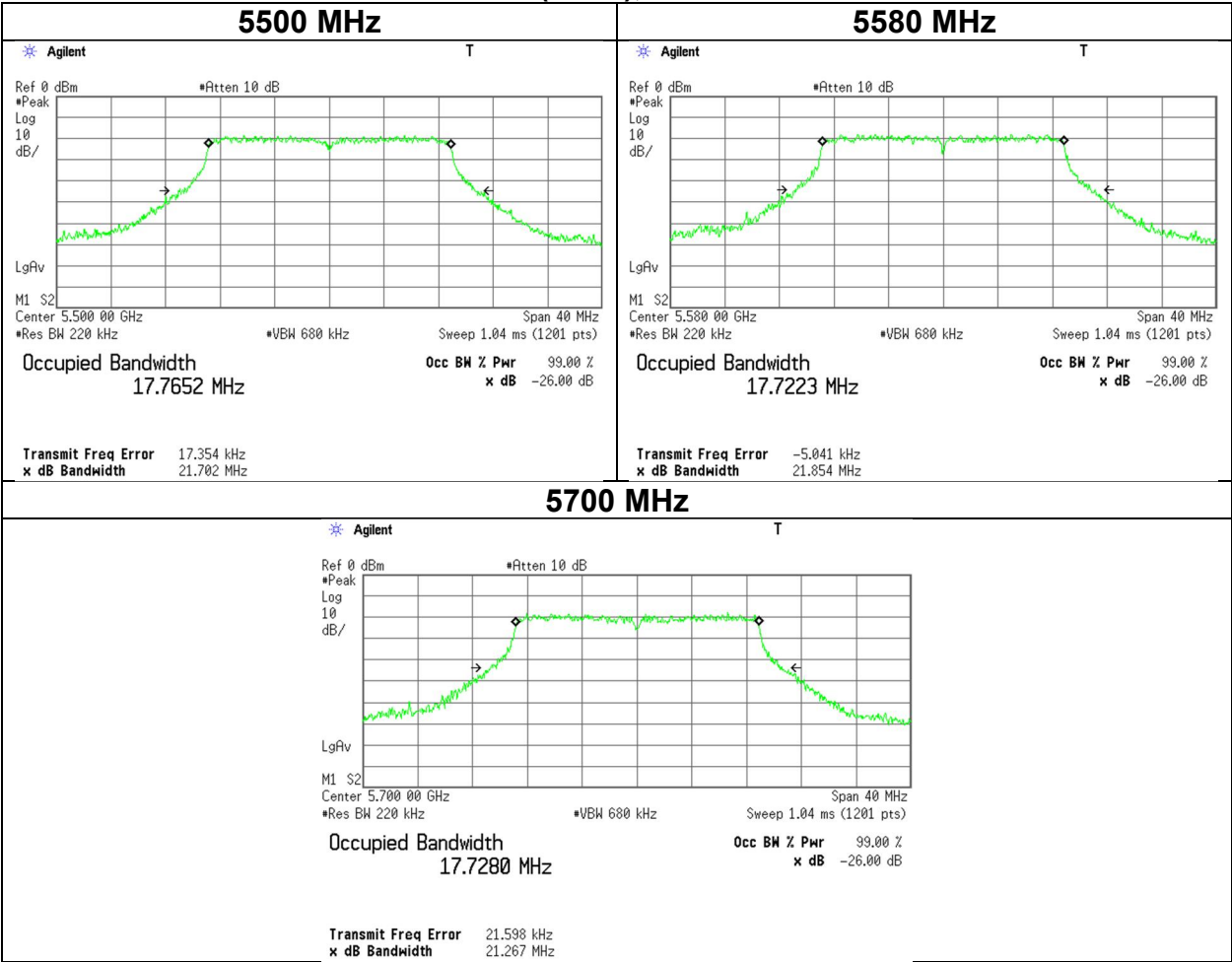
26 dB Emission Bandwidth

11n-20 (SISO), Antenna 1



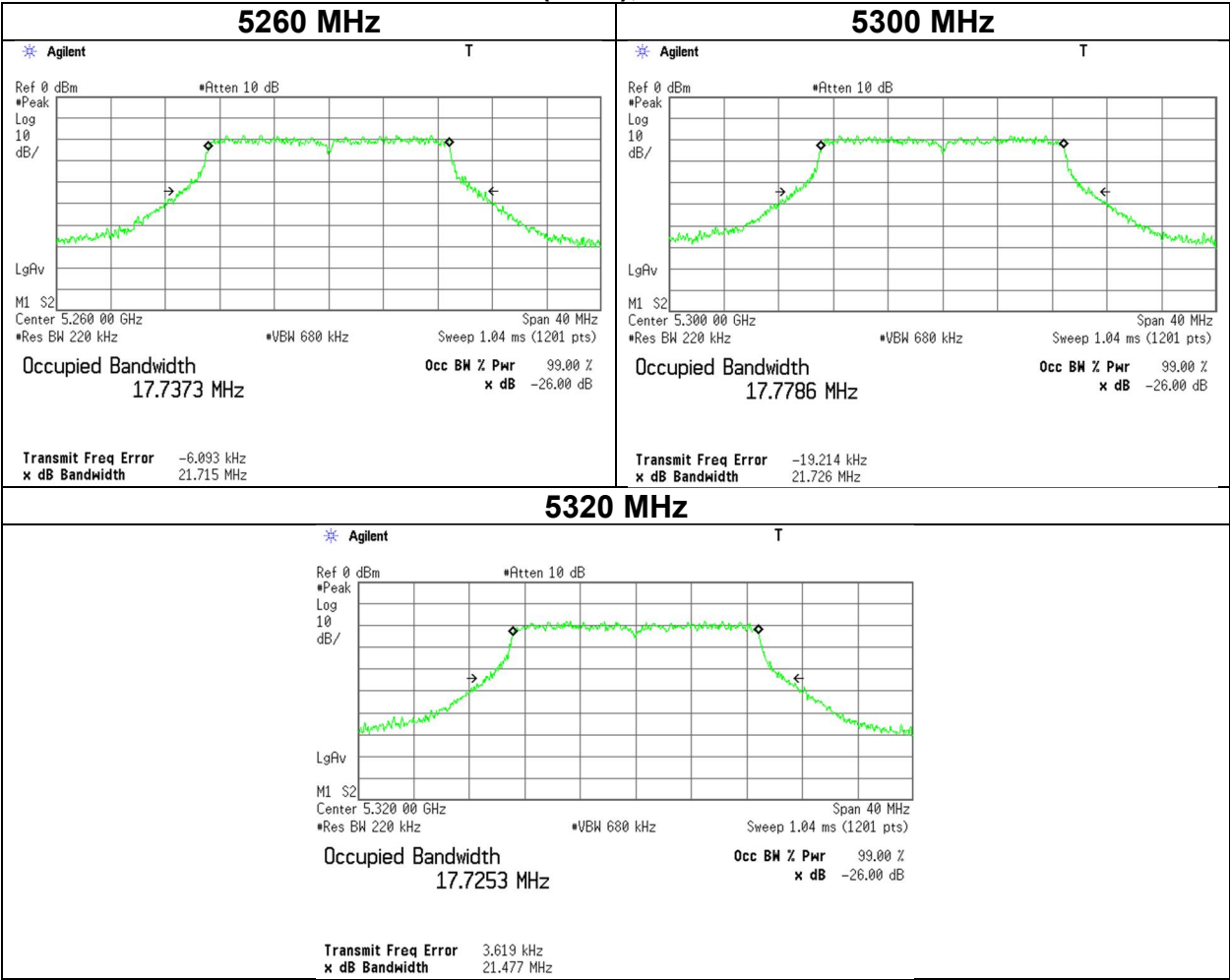
26 dB Emission Bandwidth

11n-20 (SISO), Antenna 1



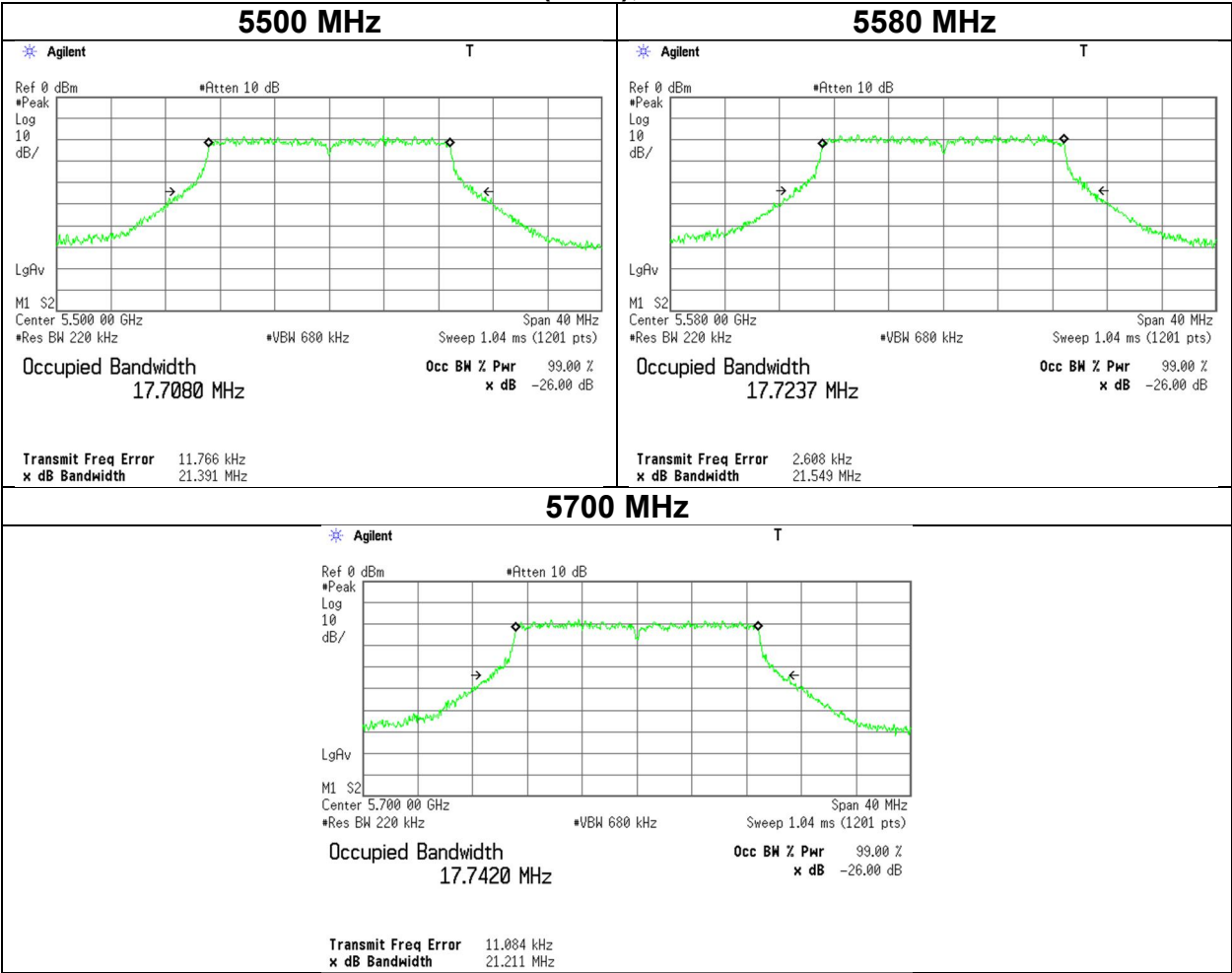
26 dB Emission Bandwidth

11n-20 (SDM), Antenna 1



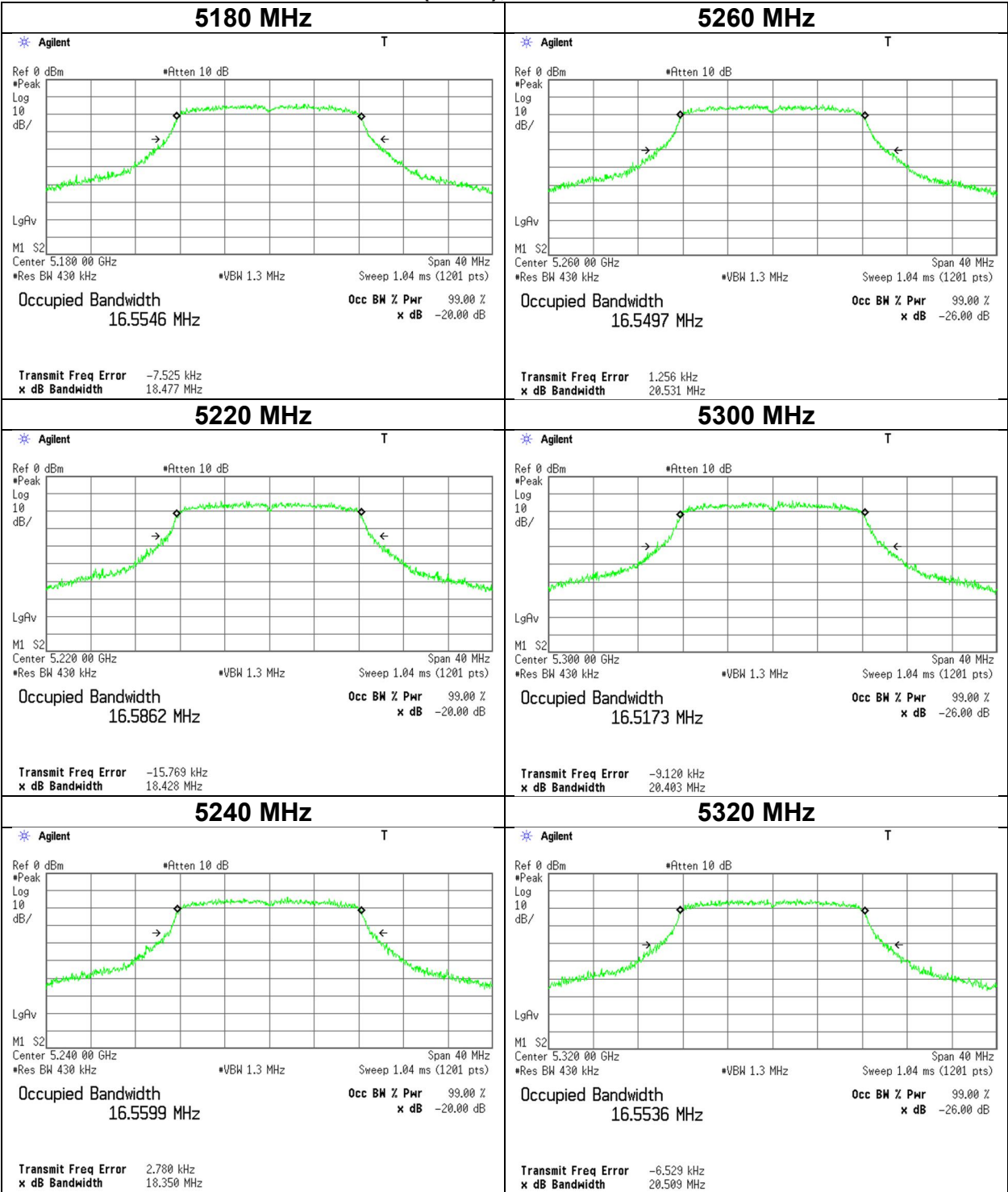
26 dB Emission Bandwidth

11n-20 (SDM), Antenna 1



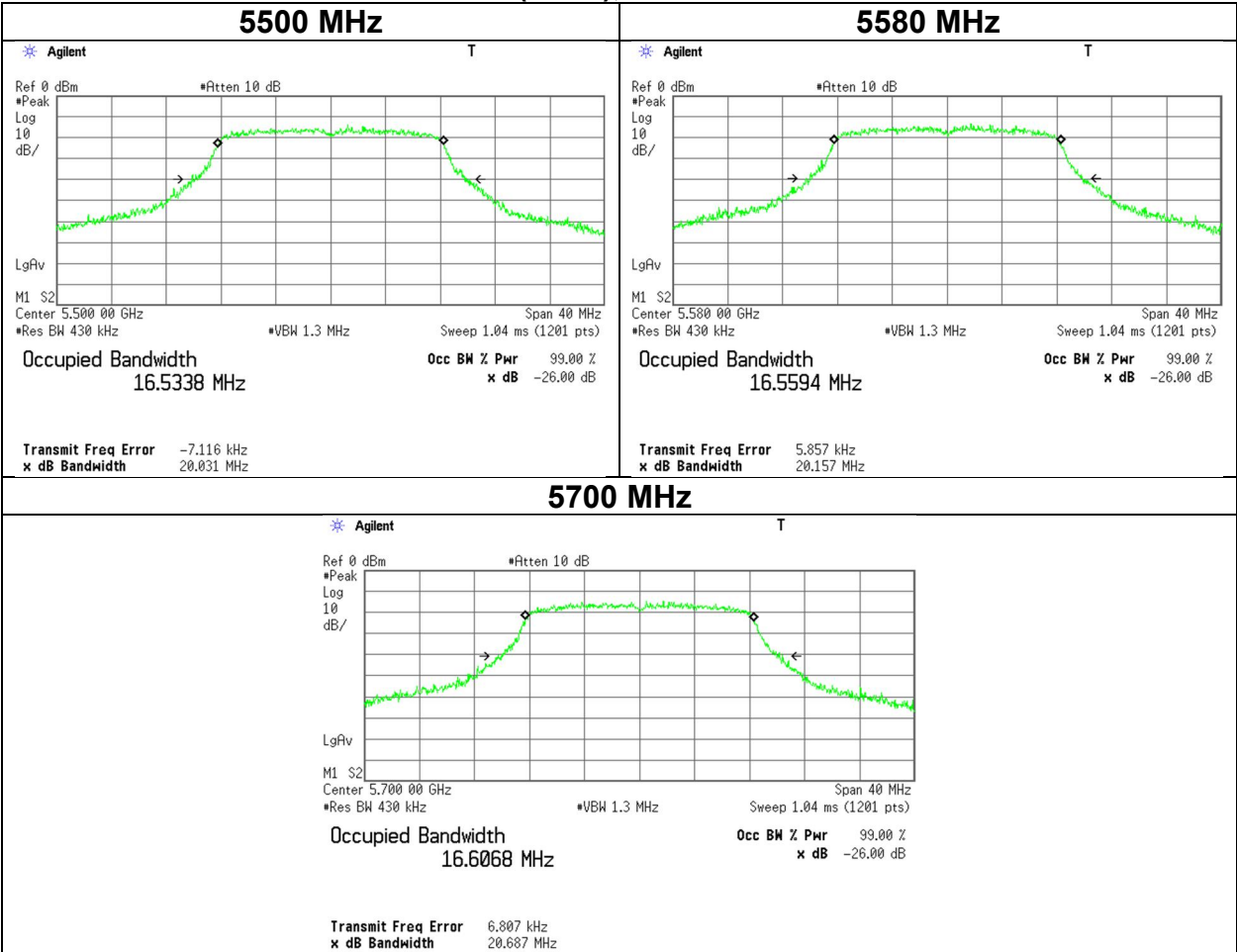
99 % Occupied Bandwidth

11a (SISO), Antenna 1



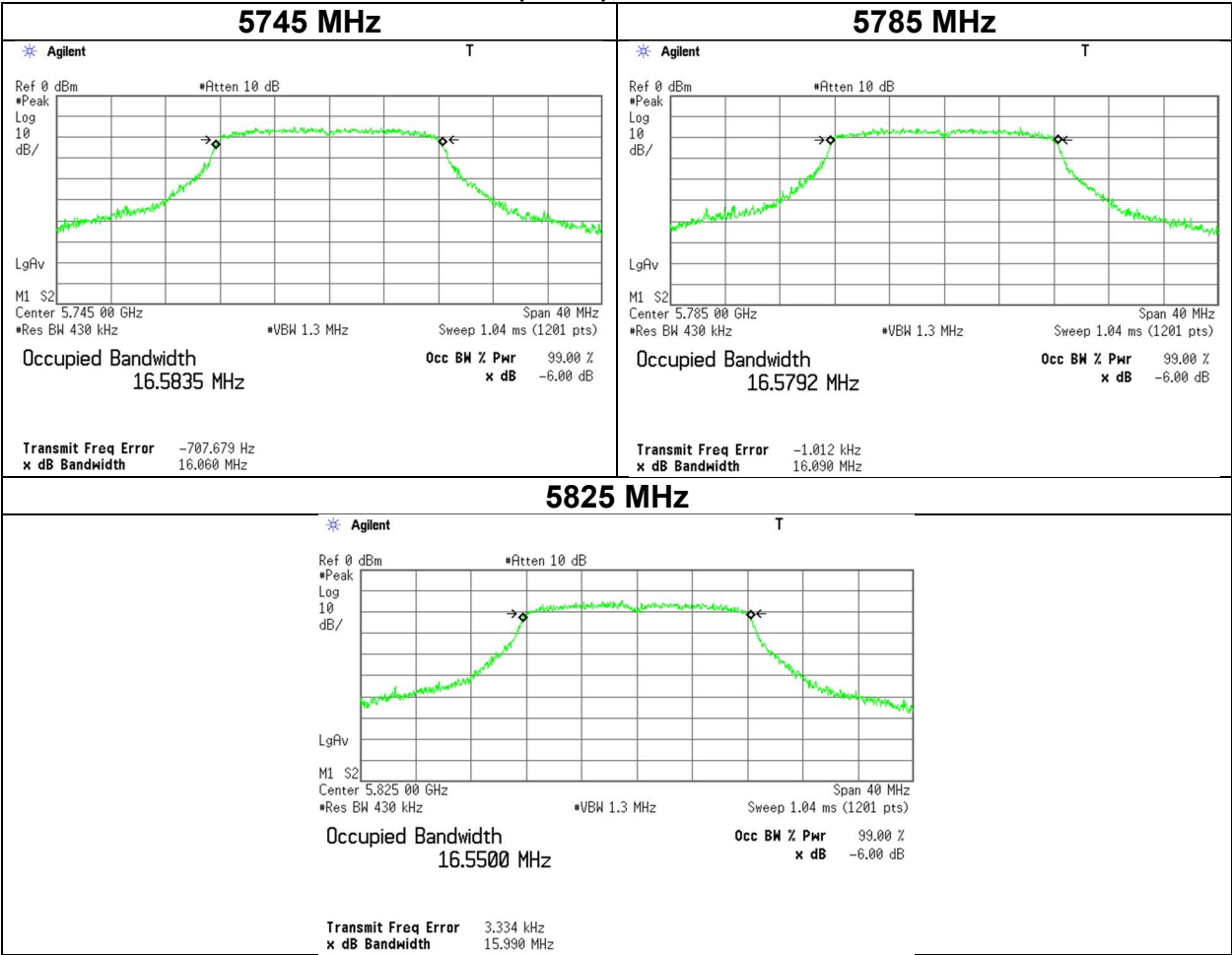
99 % Occupied Bandwidth

11a (SISO), Antenna 1



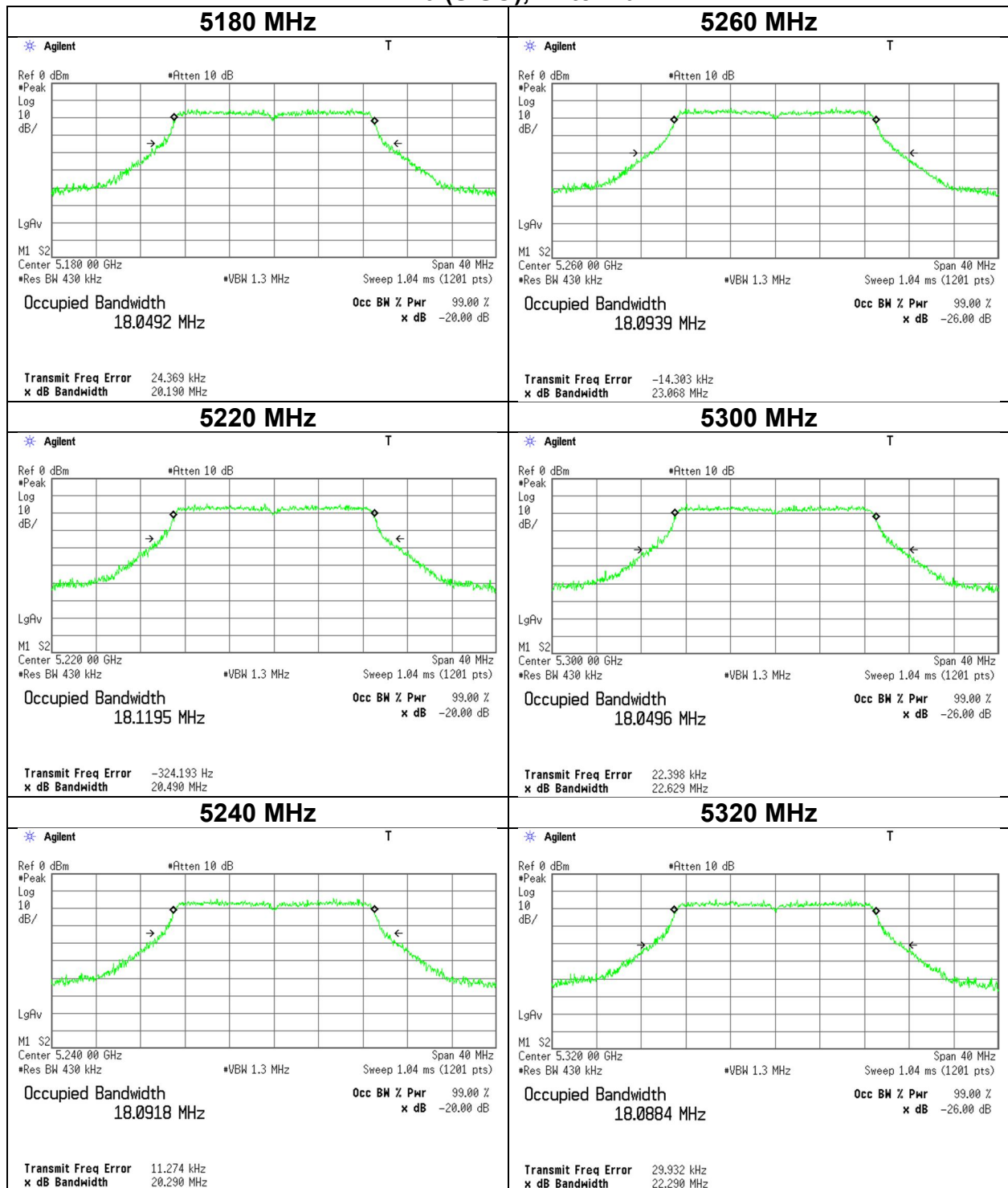
99 % Occupied Bandwidth

11a (SISO), Antenna 1



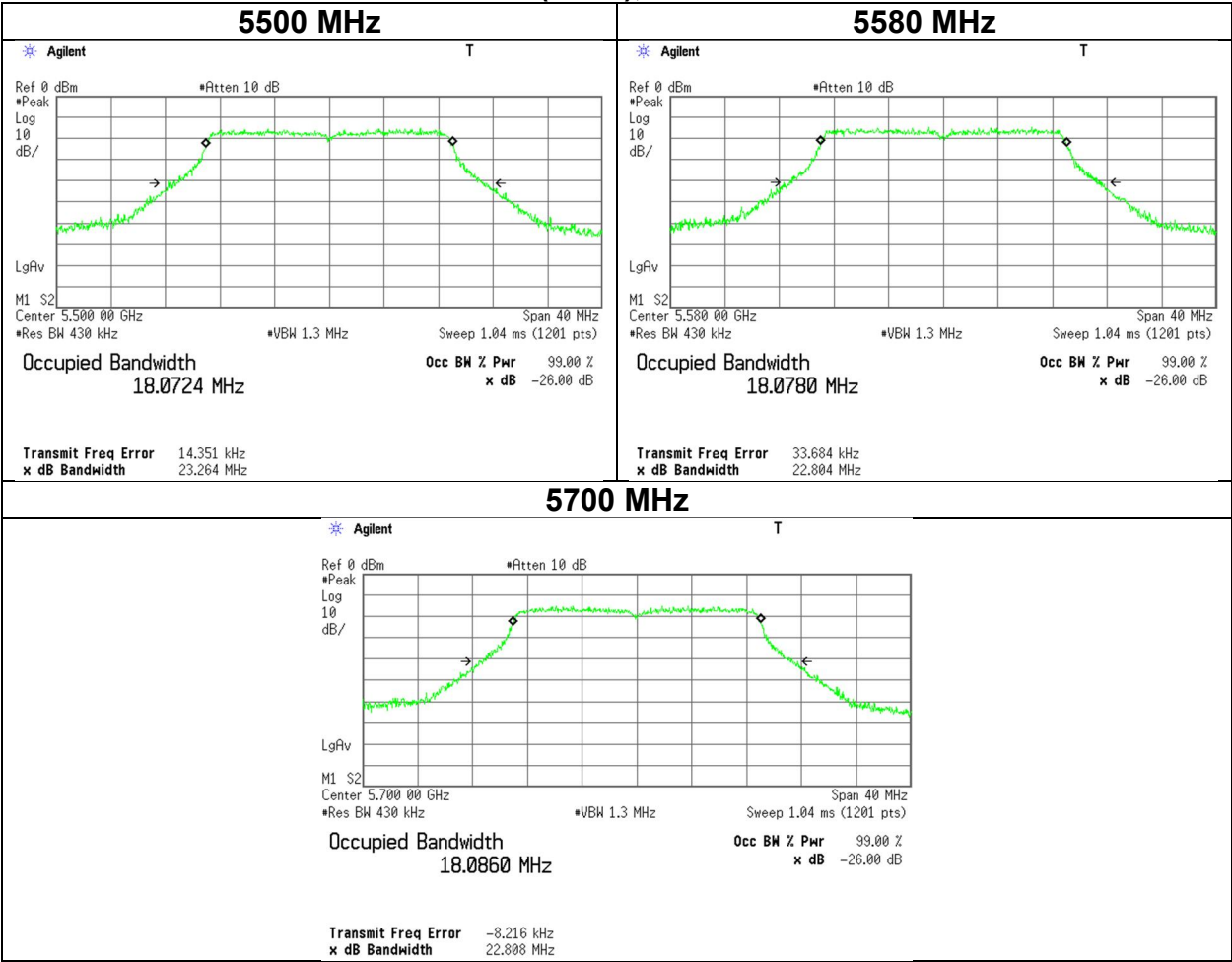
99 % Occupied Bandwidth

11n-20 (SISO), Antenna 1



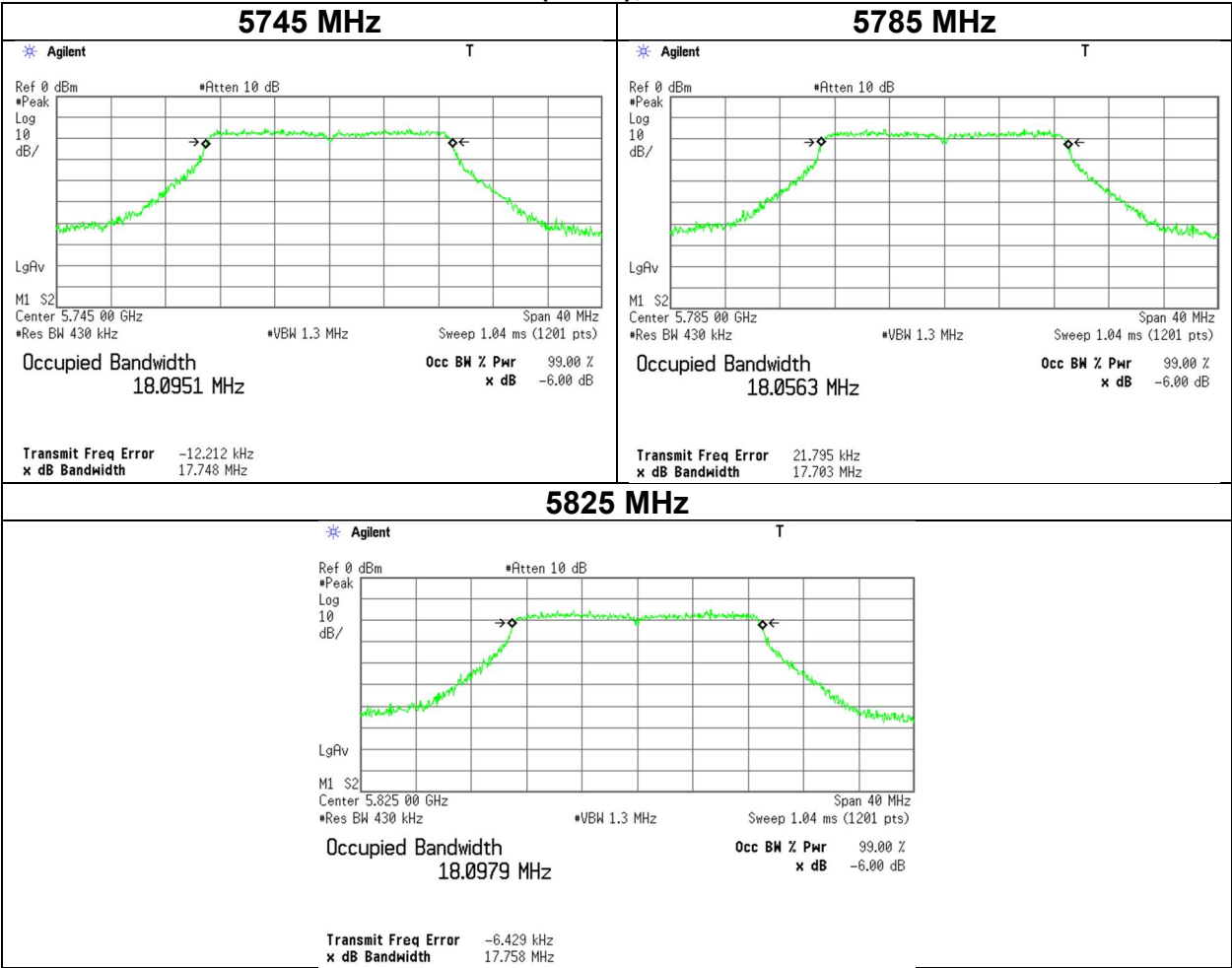
99 % Occupied Bandwidth

11n-20 (SISO), Antenna 1



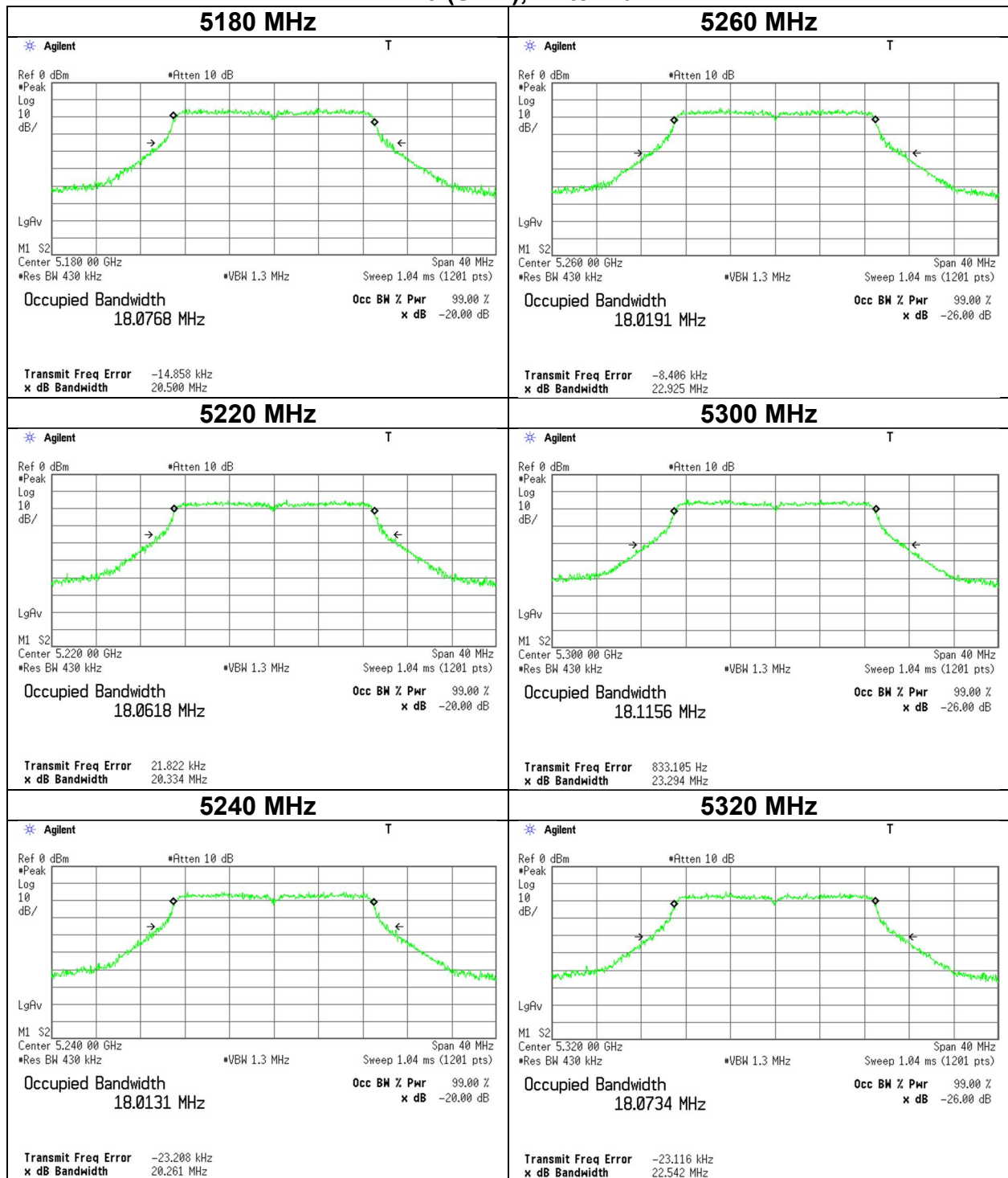
99 % Occupied Bandwidth

11n-20 (SISO), Antenna 1



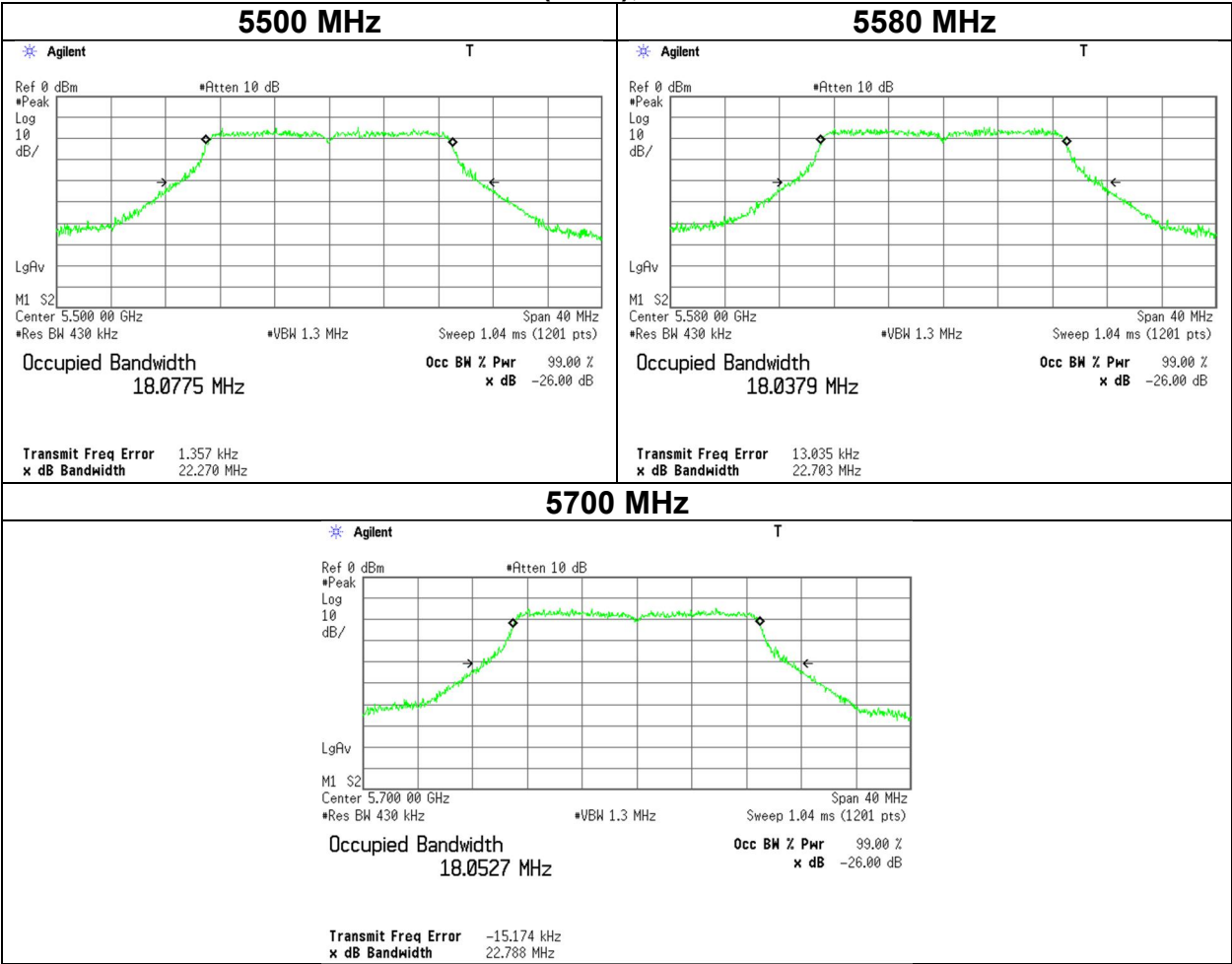
99 % Occupied Bandwidth

11n-20 (SDM), Antenna 1



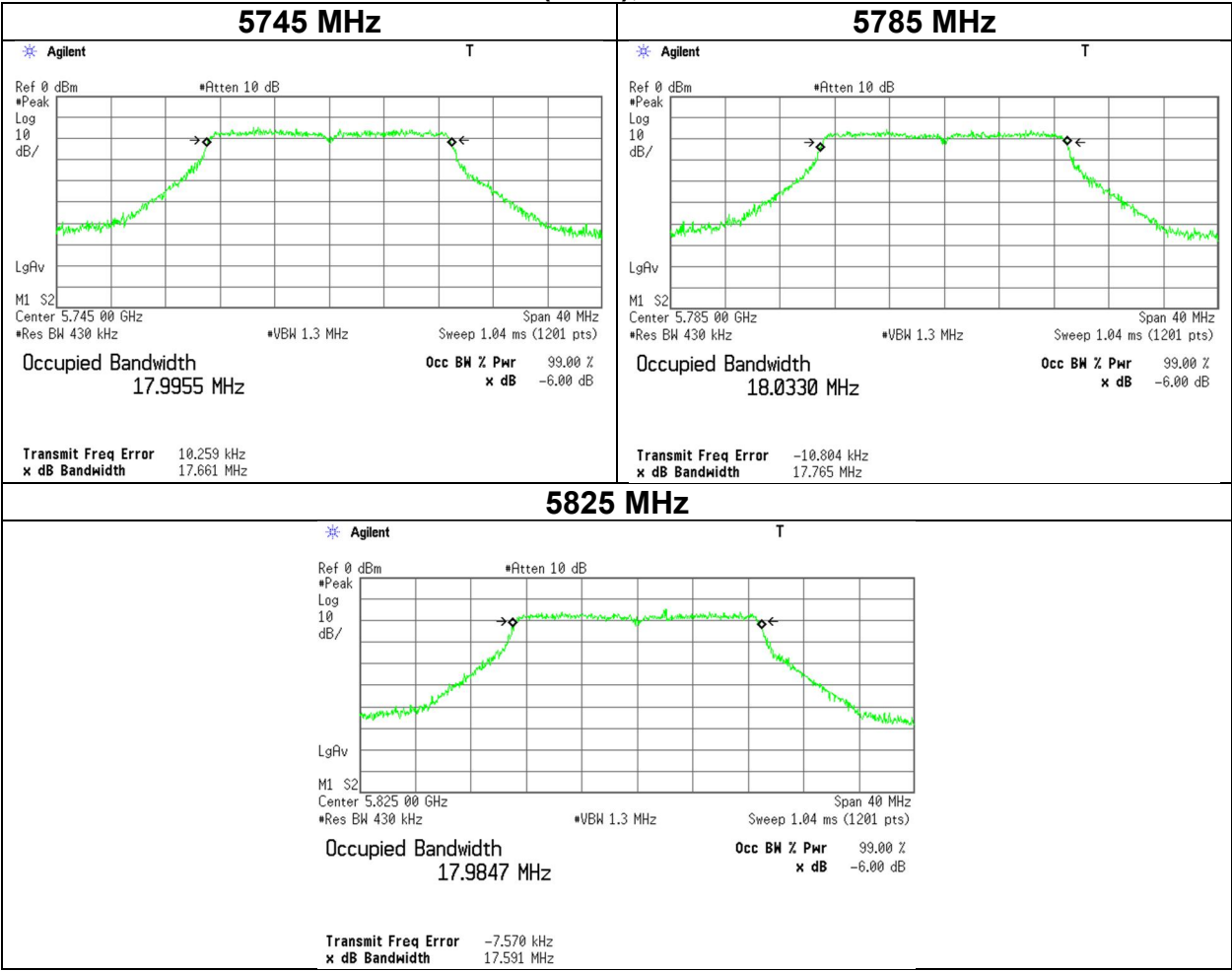
99 % Occupied Bandwidth

11n-20 (SDM), Antenna 1



99 % Occupied Bandwidth

11n-20 (SDM), Antenna 1



6 dB Bandwidth

Test place
Date
Temperature / Humidity
Engineer
Mode

Shonan EMC Lab. No.5 Shielded Room
November 15, 2023
25 deg. C / 36 % RH
Kouki Yamada
Tx

11a (SISO)

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]
Antenna 1	5745	15.420	> 0.500
	5785	15.376	> 0.500
	5825	15.166	> 0.500

11n-20 (SISO)

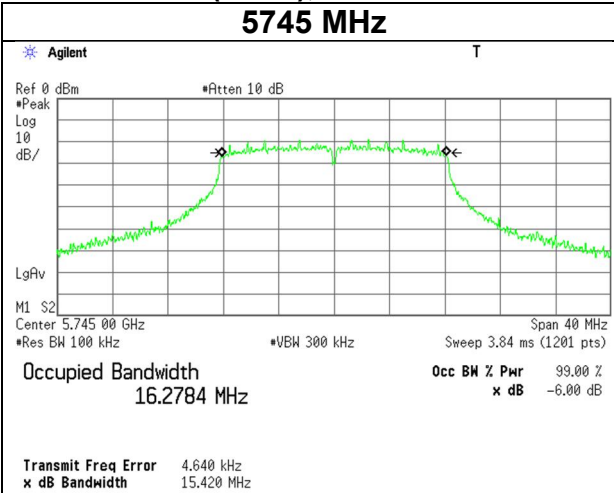
Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]
Antenna 1	5745	17.680	> 0.500
	5785	17.720	> 0.500
	5825	17.719	> 0.500

11n-20 (SDM)

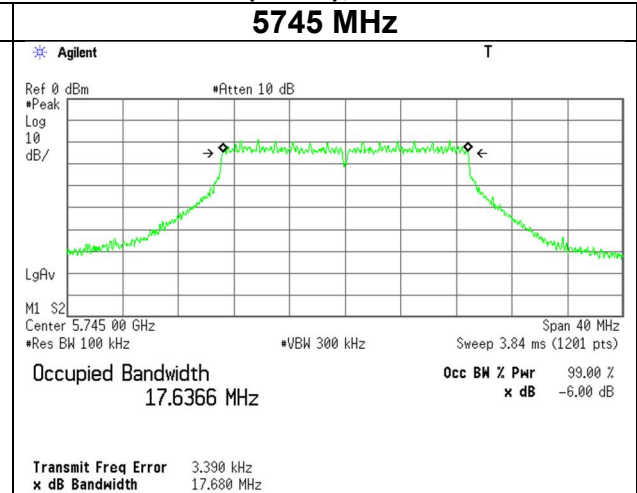
Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]
Antenna 1	5745	17.677	> 0.500
	5785	17.705	> 0.500
	5825	17.684	> 0.500

6 dB Bandwidth

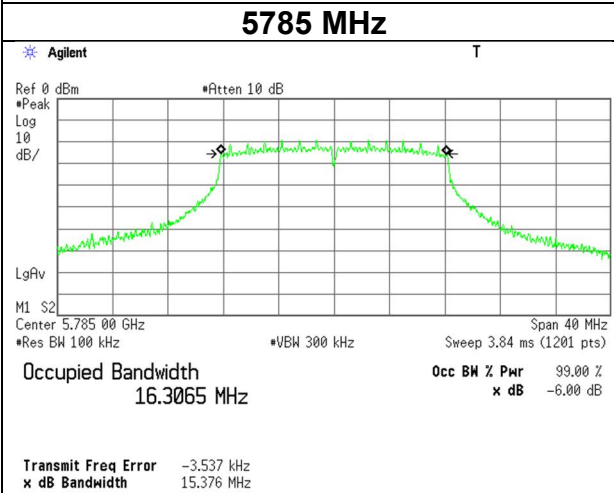
11a (SISO), Antenna 1
5745 MHz



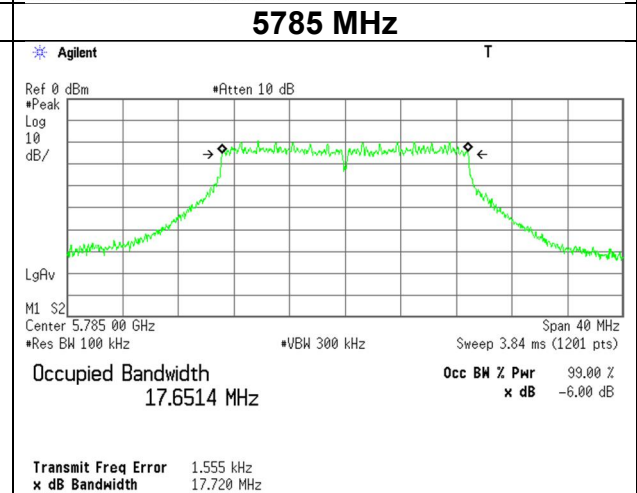
11n-20 (SISO), Antenna 1
5745 MHz



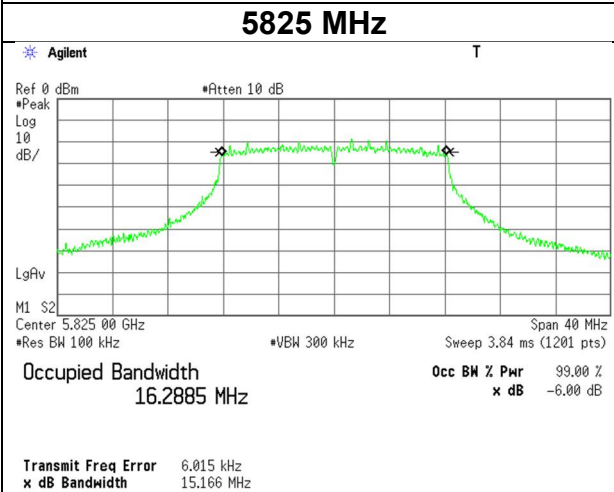
5785 MHz



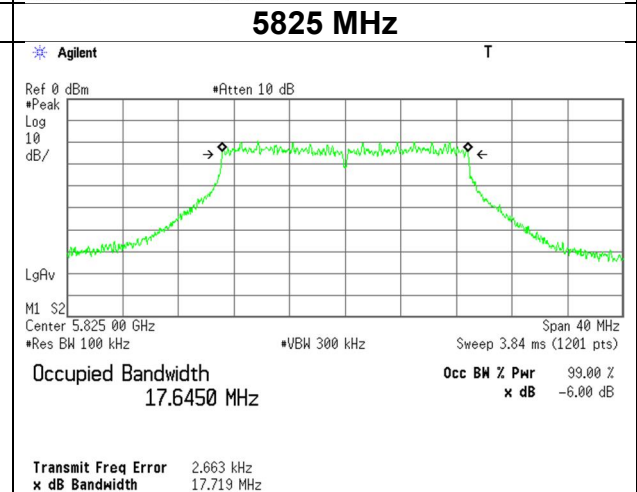
5785 MHz



5825 MHz

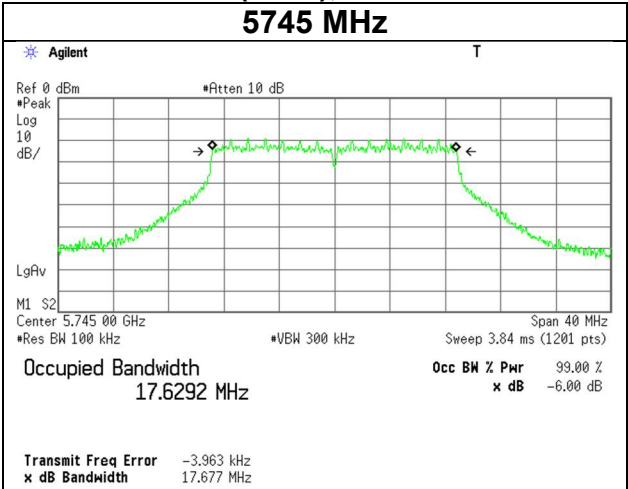


5825 MHz

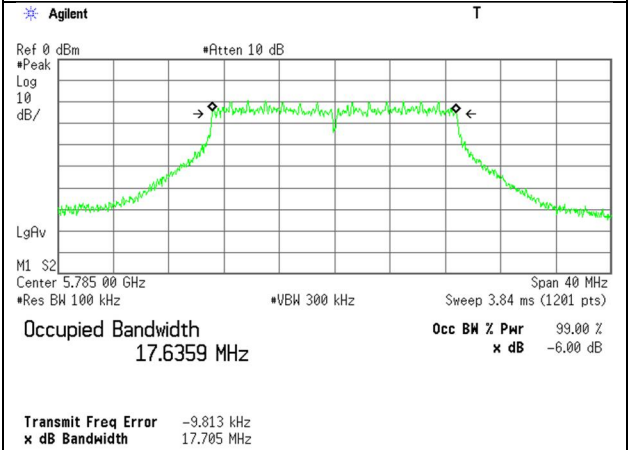


6 dB Bandwidth

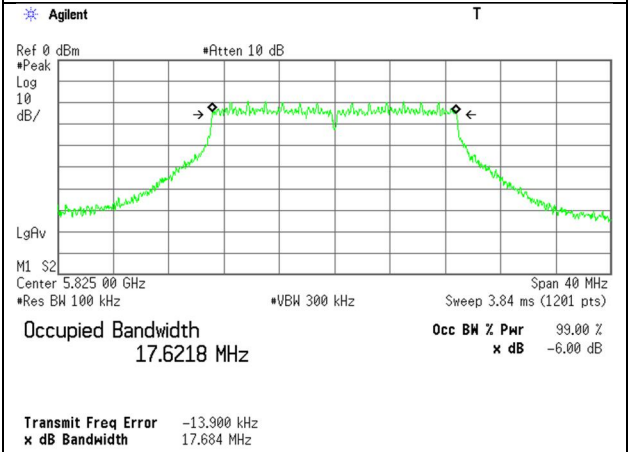
11n-20 (SDM), Antenna 1
5745 MHz



5785 MHz



5825 MHz



Maximum Conducted Output Power

Test place Shonan EMC Lab. No.5 Shielded Room
Date November 8, 2023
Temperature / Humidity 24 deg. C / 42 % RH
Engineer Makoto Hosaka
Mode Tx 11a (SISO)

11a (SISO)		(*1)		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			e.i.r.p.				
[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBi]	[MHz]	[MHz]	Result	Limit	Margin	Result	Limit	Margin	Result	Limit
								[dBm]	[mW]	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[dB]
5180	-8.51	5.12	9.98	0.00	-0.98	-	16.55	6.59	4.56	23.97	17.38	5.61	3.64	29.97	24.36
5220	-8.43	5.13	9.98	0.00	-0.98	-	16.59	6.68	4.66	23.97	17.29	5.70	3.72	29.97	24.27
5240	-8.44	5.14	9.98	0.00	-0.98	-	16.56	6.68	4.66	23.97	17.29	5.70	3.72	29.97	24.27
5260	-8.79	5.14	9.98	0.00	-0.98	19.36	16.55	6.33	4.30	23.86	17.53	5.35	3.43	29.97	24.62
5300	-8.80	5.15	9.98	0.00	-0.98	19.29	16.52	6.33	4.30	23.85	17.52	5.35	3.43	29.97	24.62
5320	-8.90	5.16	9.98	0.00	-0.98	19.84	16.55	6.24	4.21	23.97	17.73	5.26	3.36	29.97	24.71
5500	-8.87	5.21	9.98	0.00	-0.98	19.12	16.53	6.32	4.29	23.81	17.49	5.34	3.42	29.97	24.63
5580	-8.24	5.23	9.98	0.00	-0.98	19.11	16.56	6.97	4.98	23.81	16.84	5.99	3.97	29.97	23.98
5700	-8.95	5.26	9.98	0.00	-0.98	19.65	16.61	6.29	4.26	23.93	17.64	5.31	3.40	29.97	24.66
5745	-8.94	5.27	9.98	0.00	-0.98	-	16.58	6.31	4.28	30.00	23.69	5.33	3.41	36.00	30.67
5785	-9.10	5.28	9.98	0.00	-0.98	-	16.58	6.16	4.13	30.00	23.84	5.18	3.30	36.00	30.82
5825	-9.27	5.29	9.98	0.00	-0.98	-	16.55	6.00	3.98	30.00	24.00	5.02	3.18	36.00	30.98

Sample Calculation:

Conducted Power Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss

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

(*1) Power was measured with using the gate function of power meter.

Maximum Conducted Output Power

Test place Shonan EMC Lab. No.5 Shielded Room
Date November 8, 2023
Temperature / Humidity 24 deg. C / 42 % RH
Engineer Makoto Hosaka
Mode Tx 11n-20 (SISO)

11n-20 (SISO)								(*1)		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				e.i.r.p.					
								Result		Limit	Margin	Result		Limit	Margin		
[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBi]	[MHz]	[MHz]	[dBm]	[mW]	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[dB]		
5180	-8.47	5.12	9.98	0.00	-0.98	-	18.05	6.63	4.60	23.97	17.34	5.65	3.67	29.97	24.32		
5220	-8.42	5.13	9.98	0.00	-0.98	-	18.12	6.69	4.67	23.97	17.28	5.71	3.72	29.97	24.26		
5240	-8.59	5.14	9.98	0.00	-0.98	-	18.09	6.53	4.50	23.97	17.44	5.55	3.59	29.97	24.42		
5260	-8.88	5.14	9.98	0.00	-0.98	21.49	18.09	6.24	4.21	23.97	17.73	5.26	3.36	29.97	24.71		
5300	-8.80	5.15	9.98	0.00	-0.98	21.57	18.05	6.33	4.30	23.97	17.64	5.35	3.43	29.97	24.62		
5320	-8.97	5.16	9.98	0.00	-0.98	21.58	18.09	6.17	4.14	23.97	17.80	5.19	3.30	29.97	24.78		
5500	-9.11	5.21	9.98	0.00	-0.98	21.70	18.07	6.08	4.06	23.97	17.89	5.10	3.24	29.97	24.87		
5580	-8.61	5.23	9.98	0.00	-0.98	21.85	18.08	6.60	4.57	23.97	17.37	5.62	3.65	29.97	24.35		
5700	-8.94	5.26	9.98	0.00	-0.98	21.27	18.09	6.30	4.27	23.97	17.67	5.32	3.40	29.97	24.65		
5745	-8.81	5.27	9.98	0.00	-0.98	-	18.10	6.44	4.41	30.00	23.56	5.46	3.52	36.00	30.54		
5785	-9.30	5.28	9.98	0.00	-0.98	-	18.06	5.96	3.94	30.00	24.04	4.98	3.15	36.00	31.02		
5825	-9.48	5.29	9.98	0.00	-0.98	-	18.10	5.79	3.79	30.00	24.21	4.81	3.03	36.00	31.19		

Sample Calculation:

Conducted Power Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss

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

(*1) Power was measured with using the gate function of power meter.

Maximum Conducted Output Power

Test place Shonan EMC Lab. No.5 Shielded Room
Date November 8, 2023
Temperature / Humidity 24 deg. C / 42 % RH
Engineer Makoto Hosaka
Mode Tx 11n-20 (SDM)

Antenna 1+2

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	26 dB EBW [MHz]	99% OBW [MHz]	Conducted power						e.i.r.p.					
			Antenna			Result [dBm]	Limit [dBm]	Margin [dB]	Antenna			Result [dBm]	Limit [dBm]	Margin [dB]
			1 [mW]	2 [mW]	Sum [mW]				1 [mW]	2 [mW]	Sum [mW]			
5180	-	18.077	4.79	4.39	9.17	9.62	23.97	14.35	3.82	3.08	6.90	8.39	29.97	21.58
5220	-	18.062	4.85	4.52	9.37	9.72	23.97	14.25	3.87	3.17	7.04	8.48	29.97	21.49
5240	-	18.013	4.68	4.37	9.04	9.56	23.97	14.41	3.73	3.06	6.79	8.32	29.97	21.65
5260	21.715	18.019	4.30	4.16	8.45	9.27	23.97	14.70	3.43	2.92	6.35	8.02	29.97	21.95
5300	21.726	18.116	4.44	4.09	8.53	9.31	23.97	14.66	3.54	2.87	6.41	8.07	29.97	21.90
5320	21.477	18.073	4.36	4.25	8.60	9.35	23.97	14.62	3.48	2.98	6.45	8.10	29.97	21.87
5500	21.391	18.077	4.12	3.98	8.10	9.09	23.97	14.88	3.29	2.79	6.08	7.84	29.97	22.13
5580	21.549	18.038	4.99	4.29	9.27	9.67	23.97	14.30	3.98	3.01	6.99	8.44	29.97	21.53
5700	21.211	18.053	4.39	4.27	8.65	9.37	23.97	14.60	3.50	2.99	6.49	8.12	29.97	21.85
5745	-	17.995	4.48	4.18	8.66	9.37	30.00	20.63	3.57	2.93	6.50	8.13	36.00	27.87
5785	-	18.033	4.15	3.92	8.07	9.07	30.00	20.93	3.31	2.75	6.06	7.82	36.00	28.18
5825	-	17.985	3.93	3.98	7.91	8.98	30.00	21.02	3.13	2.79	5.93	7.73	36.00	28.27

(*1)		Antenna 1							Antenna 2						
Tested Frequency [MHz]	Duty Factor [dB]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Cond. Power [dBm]	e.i.r.p. [dBm]		Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Cond. Power [dBm]	e.i.r.p. [dBm]	
5180	0.00	-8.30	5.12	9.98	-0.98	6.80	5.82	-8.81	5.14	10.09	-1.54	6.42	4.88		
5220	0.00	-8.25	5.13	9.98	-0.98	6.86	5.88	-8.69	5.15	10.09	-1.54	6.55	5.01		
5240	0.00	-8.42	5.14	9.98	-0.98	6.70	5.72	-8.85	5.16	10.09	-1.54	6.40	4.86		
5260	0.00	-8.79	5.14	9.98	-0.98	6.33	5.35	-9.06	5.16	10.09	-1.54	6.19	4.65		
5300	0.00	-8.66	5.15	9.98	-0.98	6.47	5.49	-9.14	5.17	10.09	-1.54	6.12	4.58		
5320	0.00	-8.75	5.16	9.98	-0.98	6.39	5.41	-8.99	5.18	10.09	-1.54	6.28	4.74		
5500	0.00	-9.04	5.21	9.98	-0.98	6.15	5.17	-9.32	5.23	10.09	-1.54	6.00	4.46		
5580	0.00	-8.23	5.23	9.98	-0.98	6.98	6.00	-9.02	5.25	10.09	-1.54	6.32	4.78		
5700	0.00	-8.82	5.26	9.98	-0.98	6.42	5.44	-9.07	5.28	10.09	-1.54	6.30	4.76		
5745	0.00	-8.74	5.27	9.98	-0.98	6.51	5.53	-9.17	5.29	10.09	-1.54	6.21	4.67		
5785	0.00	-9.08	5.28	9.98	-0.98	6.18	5.20	-9.47	5.30	10.10	-1.54	5.93	4.39		
5825	0.00	-9.33	5.29	9.98	-0.98	5.94	4.96	-9.41	5.31	10.10	-1.54	6.00	4.46		

Sample Calculation:

Conducted Power Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss

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

(*1) Power was measured with using the gate function of power meter.

Maximum Conducted Output Power

Test place Shonan EMC Lab. No.5 Shielded Room
Date November 8, 2023
Temperature / Humidity 24 deg. C / 42 % RH
Engineer Makoto Hosaka
Mode Tx 11a (SISO)

5180 MHz (Antenna 1)

(*1)

Mode	Rate Mbps	Reading (timed average) [dBm]	Duty factor [dB]	Burst power [dBm]	Remarks
11a	6	-8.99	0.00	-8.99	
	9	-8.99	0.00	-8.99	
	12	-8.95	0.00	-8.95	*
	18	-8.98	0.00	-8.98	
	24	-9.39	0.00	-9.39	
	36	-9.16	0.00	-9.16	
	48	-9.04	0.00	-9.04	
	54	-9.03	0.00	-9.03	

* Worst rate

Sample Calculation:

Burst power = Reading (timed average)

All comparison were carried out on same frequency and measurement factors.

(*1) Power was measured with using the gate function of power meter.

5180 MHz (Antenna 2)

(*1)

Mode	Rate Mbps	Reading (timed average) [dBm]	Duty factor [dB]	Burst power [dBm]	Remarks
11a	6	-9.09	0.00	-9.09	
	9	-9.12	0.00	-9.12	
	12	-9.14	0.00	-9.14	
	18	-9.07	0.00	-9.07	
	24	-9.53	0.00	-9.53	
	36	-9.46	0.00	-9.46	
	48	-9.39	0.00	-9.39	
	54	-9.38	0.00	-9.38	

* Worst rate

Sample Calculation:

Burst power = Reading (timed average)

All comparison were carried out on same frequency and measurement factors.

(*1) Power was measured with using the gate function of power meter.

Maximum Conducted Output Power

Test place
Date
Temperature / Humidity
Engineer
Mode

Shonan EMC Lab. No.5 Shielded Room
November 8, 2023
24 deg. C / 42 % RH
Makoto Hosaka
Tx 11n-20 (SISO)

5180 MHz (Antenna 1)

(*1)

Mode	MCS Number	Reading (timed average) [dBm]	Duty factor [dB]	Burst power [dBm]	Remarks
11n-20	0	-9.17	0.00	-9.17	
	1	-9.19	0.00	-9.19	
	2	-9.13	0.00	-9.13	
	3	-9.42	0.00	-9.42	
	4	-9.38	0.00	-9.38	
	5	-9.02	0.00	-9.02	
	6	-8.97	0.00	-8.97	*
	7	-9.00	0.00	-9.00	

* Worst rate

Sample Calculation:

Burst power = Reading (timed average)

All comparison were carried out on same frequency and measurement factors.

(*1) Power was measured with using the gate function of power meter.

5180 MHz (Antenna 2)

(*1)

Mode	MCS Number	Reading (timed average) [dBm]	Duty factor [dB]	Burst power [dBm]	Remarks
11n-20	0	-9.25	0.00	-9.25	
	1	-9.32	0.00	-9.32	
	2	-9.22	0.00	-9.22	
	3	-9.49	0.00	-9.49	
	4	-9.45	0.00	-9.45	
	5	-9.31	0.00	-9.31	
	6	-9.24	0.00	-9.24	
	7	-9.33	0.00	-9.33	

* Worst rate

Sample Calculation:

Burst power = Reading (timed average)

All comparison were carried out on same frequency and measurement factors.

(*1) Power was measured with using the gate function of power meter.

Maximum Conducted Output Power

Test place Shonan EMC Lab. No.5 Shielded Room
Date November 8, 2023
Temperature / Humidity 24 deg. C / 42 % RH
Engineer Makoto Hosaka
Mode Tx 11n-20 (SDM)

5180 MHz

(*1)

Mode	MCS Number	Reading (timed average)						Duty factor	Burst power			Remarks
		Antenna							Antenna			
		1 [dBm]	2 [dBm]	1 [mW]	2 [mW]	1+2 [mW]	1+2 [dBm]		1 [dBm]	2 [dBm]	1+2 [dBm]	
11n-20	8	-9.46	-9.27	0.11	0.12	0.23	-6.35	0.00	-	-	-6.35	
	9	-9.42	-9.34	0.11	0.12	0.23	-6.37	0.00	-	-	-6.37	
	10	-9.35	-9.22	0.12	0.12	0.24	-6.27	0.00	-	-	-6.27	
	11	-9.40	-9.42	0.11	0.11	0.23	-6.40	0.00	-	-	-6.40	
	12	-9.32	-9.52	0.12	0.11	0.23	-6.41	0.00	-	-	-6.41	
	13	-8.98	-9.29	0.13	0.12	0.24	-6.12	0.00	-	-	-6.12	
	14	-8.92	-9.34	0.13	0.12	0.24	-6.11	0.00	-	-	-6.11	
	15	-8.83	-9.37	0.13	0.12	0.25	-6.08	0.00	-	-	-6.08	*

* Worst rate

Sample Calculation:

Burst power = Reading (timed average)

All comparison were carried out on same frequency and measurement factors.

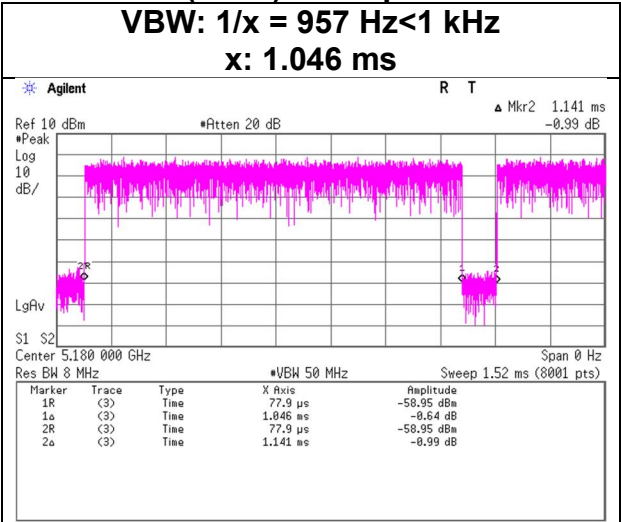
(*1) Power was measured with using the gate function of power meter.

Burst rate confirmation

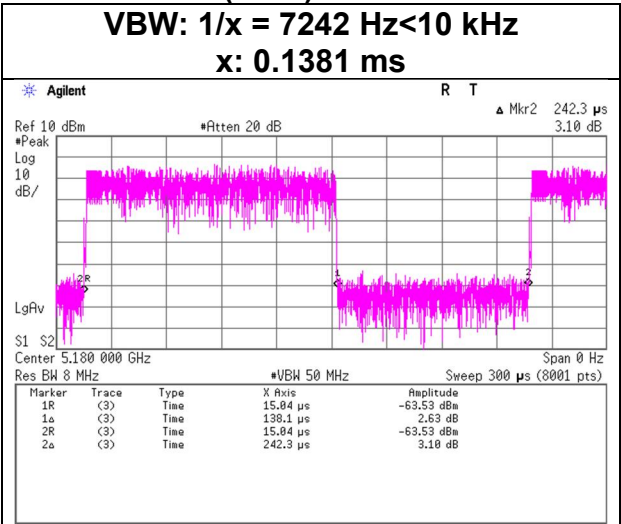
Test place
Date
Temperature / Humidity
Engineer
Mode

Shonan EMC Lab. No.5 Shielded Room
November 8, 2023
24 deg. C / 42 % RH
Makoto Hosaka
Tx

11a (SISO) 12 Mbps
VBW: $1/x = 957 \text{ Hz} < 1 \text{ kHz}$
x: 1.046 ms



11n-20 (SDM) MCS15
VBW: $1/x = 7242 \text{ Hz} < 10 \text{ kHz}$
x: 0.1381 ms



Maximum Power Spectral Density

Test place Shonan EMC Lab. No.5 Shielded Room
Date November 15, 2023 November 17, 2023
Temperature / Humidity 25 deg. C / 36 % RH 25 deg. C / 51 % RH
Engineer Kouki Yamada Kouki Yamada
Mode Tx 11a

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

Tested Frequency	PSD Reading	Cable Loss	Atten. Loss	Duty Factor	Antenna Gain	RBW Correction Factor	PSD (Conducted)			PSD (e.i.r.p.)		
[MHz]	[dBm/MHz]	[dB]	[dB]	[dB]	[dBi]	[dB]	Result	Limit	Margin	Result	Limit	Margin
							[dBm/MHz]	[dBm/MHz]	[dB]	[dBm/MHz]	[dBm/MHz]	[dB]
5180	-18.44	5.12	9.98	0.00	-0.98	0.00	-3.34	11.00	14.34	-4.32	17.00	21.32
5220	-18.55	5.13	9.98	0.00	-0.98	0.00	-3.44	11.00	14.44	-4.42	17.00	21.42
5240	-18.17	5.14	9.98	0.00	-0.98	0.00	-3.05	11.00	14.05	-4.03	17.00	21.03
5260	-19.06	5.14	9.98	0.00	-0.98	0.00	-3.94	11.00	14.94	-4.92	17.00	21.92
5300	-19.06	5.15	9.98	0.00	-0.98	0.00	-3.93	11.00	14.93	-4.91	17.00	21.91
5320	-19.31	5.16	9.98	0.00	-0.98	0.00	-4.17	11.00	15.17	-5.15	17.00	22.15
5500	-19.31	5.21	9.98	0.00	-0.98	0.00	-4.12	11.00	15.12	-5.10	17.00	22.10
5580	-18.66	5.23	9.98	0.00	-0.98	0.00	-3.45	11.00	14.45	-4.43	17.00	21.43
5700	-19.37	5.26	9.98	0.00	-0.98	0.00	-4.13	11.00	15.13	-5.11	17.00	22.11
5745	-28.12	5.27	9.98	0.00	-0.98	6.99	-5.88	30.00	35.88	-6.86	36.00	42.86
5785	-28.17	5.28	9.98	0.00	-0.98	6.99	-5.92	30.00	35.92	-6.90	36.00	42.90
5825	-28.40	5.29	9.98	0.00	-0.98	6.99	-6.14	30.00	36.14	-7.12	36.00	43.12

Sample Calculation:

PSD: Power Spectral Density

The PSD within 5725 MHz to 5825 MHz are based on any 500 kHz band.

RBW Correction Factor = $10 \cdot \log(\text{Specified bandwidth} / \text{Measured bandwidth})$

PSD Result (Conducted) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + RBW Correction Factor

PSD Result (e.i.r.p.) = Conducted PSD Result + Antenna Gain

(*1) Power density was measured with using the gate function of spectrum analyzer.

Maximum Power Spectral Density

Test place Shonan EMC Lab. No.5 Shielded Room
Date November 17, 2023
Temperature / Humidity 25 deg. C / 51 % RH
Engineer Kouki Yamada
Mode Tx 11n-20 (SISO)

Antenna 1 (*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)			PSD (e.i.r.p.)		
							Result	Limit	Margin	Result	Limit	Margin
5180	-19.51	5.12	9.98	0.00	-0.98	0.00	-4.41	11.00	15.41	-5.39	17.00	22.39
5220	-19.08	5.13	9.98	0.00	-0.98	0.00	-3.97	11.00	14.97	-4.95	17.00	21.95
5240	-19.45	5.14	9.98	0.00	-0.98	0.00	-4.33	11.00	15.33	-5.31	17.00	22.31
5260	-19.99	5.14	9.98	0.00	-0.98	0.00	-4.87	11.00	15.87	-5.85	17.00	22.85
5300	-19.55	5.15	9.98	0.00	-0.98	0.00	-4.42	11.00	15.42	-5.40	17.00	22.40
5320	-20.18	5.16	9.98	0.00	-0.98	0.00	-5.04	11.00	16.04	-6.02	17.00	23.02
5500	-20.08	5.21	9.98	0.00	-0.98	0.00	-4.89	11.00	15.89	-5.87	17.00	22.87
5580	-19.35	5.23	9.98	0.00	-0.98	0.00	-4.14	11.00	15.14	-5.12	17.00	22.12
5700	-20.01	5.26	9.98	0.00	-0.98	0.00	-4.77	11.00	15.77	-5.75	17.00	22.75
5745	-28.76	5.27	9.98	0.00	-0.98	6.99	-6.52	30.00	36.52	-7.50	36.00	43.50
5785	-29.17	5.28	9.98	0.00	-0.98	6.99	-6.92	30.00	36.92	-7.90	36.00	43.90
5825	-29.75	5.29	9.98	0.00	-0.98	6.99	-7.49	30.00	37.49	-8.47	36.00	44.47

Sample Calculation:

PSD: Power Spectral Density

The PSD within 5725 MHz to 5825 MHz are based on any 500 kHz band.

RBW Correction Factor = $10 \cdot \log(\text{Specified bandwidth} / \text{Measured bandwidth})$

PSD Result (Conducted) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + RBW Correction Factor

PSD Result (e.i.r.p.) = Conducted PSD Result + Antenna Gain

(*1) Power density was measured with using the gate function of spectrum analyzer.

Maximum Power Spectral Density

Test place
Date
Temperature / Humidity
Engineer
Mode

Shonan EMC Lab. No.5 Shielded Room
November 17, 2023
25 deg. C / 51 % RH
Kouki Yamada
Tx 11n-20 (SDM)

Antenna 1+2 Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	PSD (Conducted)						PSD (e.i.r.p.)					
	Antenna		Sum [mW/MHz]	Result [dBm/MHz]	Limit [dBm/MHz]	Margin [dB]	Antenna		Sum [mW/MHz]	Result [dBm/MHz]	Limit [dBm/MHz]	Margin [dB]
	1 [mW/MHz]	2 [mW/MHz]					1 [mW/MHz]	2 [mW/MHz]				
5180	0.38	0.34	0.71	-1.48	11.00	12.48	0.30	0.24	0.54	-2.71	17.00	19.71
5220	0.39	0.39	0.78	-1.09	11.00	12.09	0.31	0.27	0.58	-2.34	17.00	19.34
5240	0.36	0.38	0.74	-1.30	11.00	12.30	0.29	0.26	0.55	-2.56	17.00	19.56
5260	0.33	0.35	0.68	-1.70	11.00	12.70	0.26	0.24	0.51	-2.96	17.00	19.96
5300	0.37	0.33	0.70	-1.53	11.00	12.53	0.30	0.23	0.53	-2.77	17.00	19.77
5320	0.35	0.34	0.69	-1.60	11.00	12.60	0.28	0.24	0.52	-2.85	17.00	19.85
5500	0.31	0.34	0.65	-1.86	11.00	12.86	0.25	0.24	0.49	-3.13	17.00	20.13
5580	0.37	0.35	0.73	-1.40	11.00	12.40	0.30	0.25	0.54	-2.64	17.00	19.64
5700	0.27	0.36	0.63	-2.01	11.00	13.01	0.22	0.25	0.47	-3.30	17.00	20.30
5745	0.22	0.17	0.39	-4.11	30.00	34.11	0.17	0.12	0.29	-5.33	36.00	41.33
5785	0.24	0.22	0.47	-3.32	30.00	33.32	0.20	0.15	0.35	-4.56	36.00	40.56
5825	0.19	0.21	0.40	-3.93	30.00	33.93	0.16	0.15	0.30	-5.19	36.00	41.19

Tested Frequency [MHz]	Antenna 1							Antenna 2						
	Duty Factor [dB]	RBW Correction Factor [dB]	PSD Reading [dBm/MHz]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	PSD Result Cond. [dBm/MHz]	PSD Result e.i.r.p. [dBm/MHz]	PSD Reading [dBm/MHz]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	PSD Result Cond. [dBm/MHz]	PSD Result e.i.r.p. [dBm/MHz]
5180	0.00	0.00	-19.35	5.12	9.98	-0.98	-4.25	-5.23	-19.85	5.12	9.98	-1.54	-4.75	-6.29
5220	0.00	0.00	-19.23	5.13	9.98	-0.98	-4.12	-5.10	-19.19	5.13	9.98	-1.54	-4.08	-5.62
5240	0.00	0.00	-19.51	5.14	9.98	-0.98	-4.39	-5.37	-19.36	5.14	9.98	-1.54	-4.24	-5.78
5260	0.00	0.00	-19.96	5.14	9.98	-0.98	-4.84	-5.82	-19.71	5.14	9.98	-1.54	-4.59	-6.13
5300	0.00	0.00	-19.45	5.15	9.98	-0.98	-4.32	-5.30	-19.91	5.15	9.98	-1.54	-4.78	-6.32
5320	0.00	0.00	-19.71	5.16	9.98	-0.98	-4.57	-5.55	-19.81	5.16	9.98	-1.54	-4.67	-6.21
5500	0.00	0.00	-20.27	5.21	9.98	-0.98	-5.08	-6.06	-19.87	5.21	9.98	-1.54	-4.68	-6.22
5580	0.00	0.00	-19.52	5.23	9.98	-0.98	-4.31	-5.29	-19.71	5.23	9.98	-1.54	-4.50	-6.04
5700	0.00	0.00	-20.87	5.26	9.98	-0.98	-5.63	-6.61	-19.73	5.26	9.98	-1.54	-4.49	-6.03
5745	0.00	6.99	-28.85	5.27	9.98	-0.98	-6.61	-7.59	-29.94	5.27	9.98	-1.54	-7.70	-9.24
5785	0.00	6.99	-28.37	5.28	9.98	-0.98	-6.12	-7.10	-28.81	5.28	9.98	-1.54	-6.56	-8.10
5825	0.00	6.99	-29.37	5.29	9.98	-0.98	-7.11	-8.09	-29.03	5.29	9.98	-1.54	-6.77	-8.31

Sample Calculation:

PSD: Power Spectral Density

The PSD within 5725 MHz to 5825 MHz are based on any 500 kHz band.

RBW Correction Factor = $10 \cdot \log$ (Specified bandwidth / Measured bandwidth)

PSD Result (Conducted) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + RBW Correction Factor

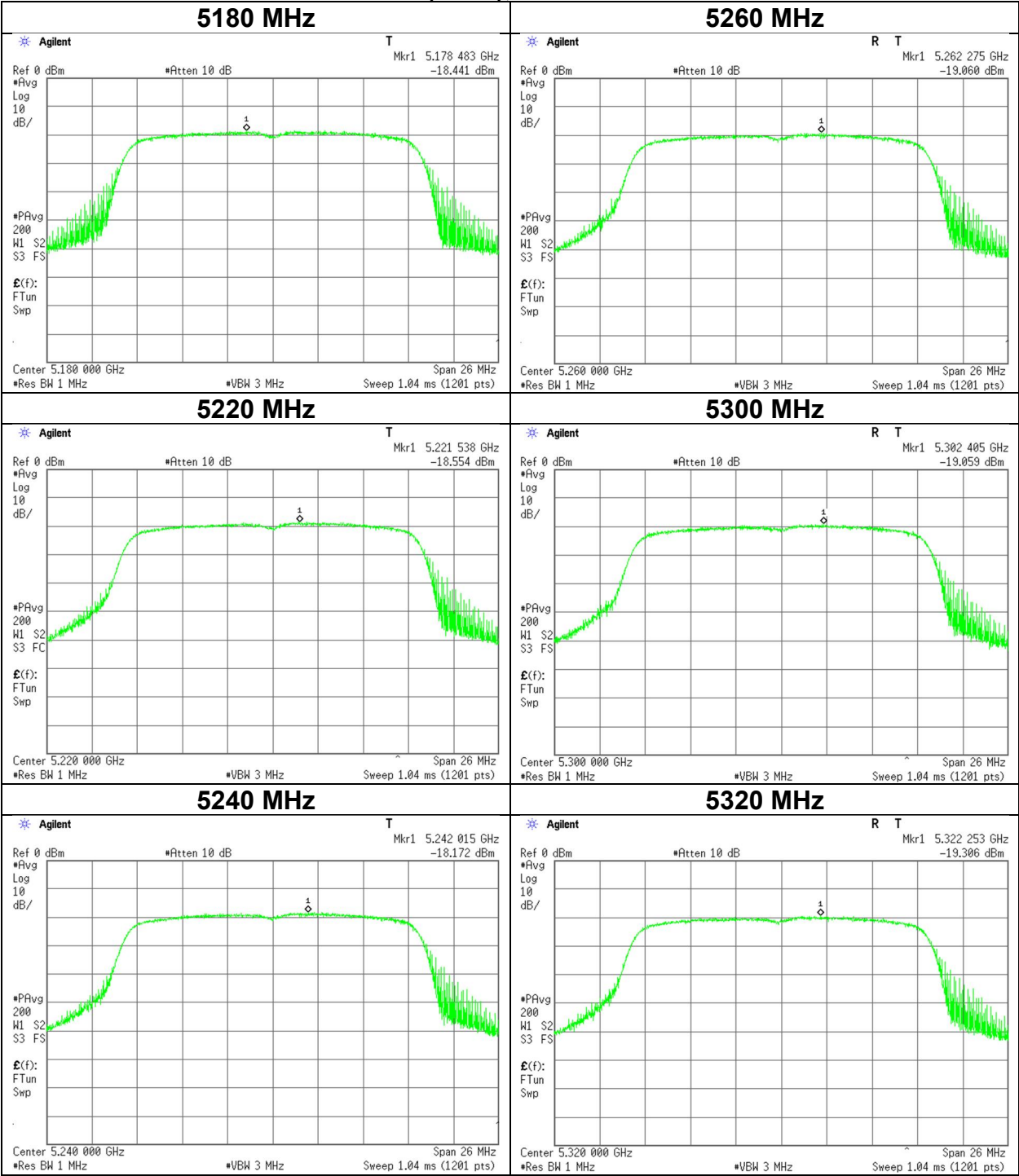
PSD Result (e.i.r.p.) = Conducted PSD Result + Antenna Gain

(*1) Power density was measured with using the gate function of spectrum analyzer.

Maximum Power Spectral Density

Test place Shonan EMC Lab. No.5 Shielded Room
Date November 17, 2023
Temperature / Humidity 25 deg. C / 51 % RH
Engineer Kouki Yamada
Mode Tx 11a (SISO)

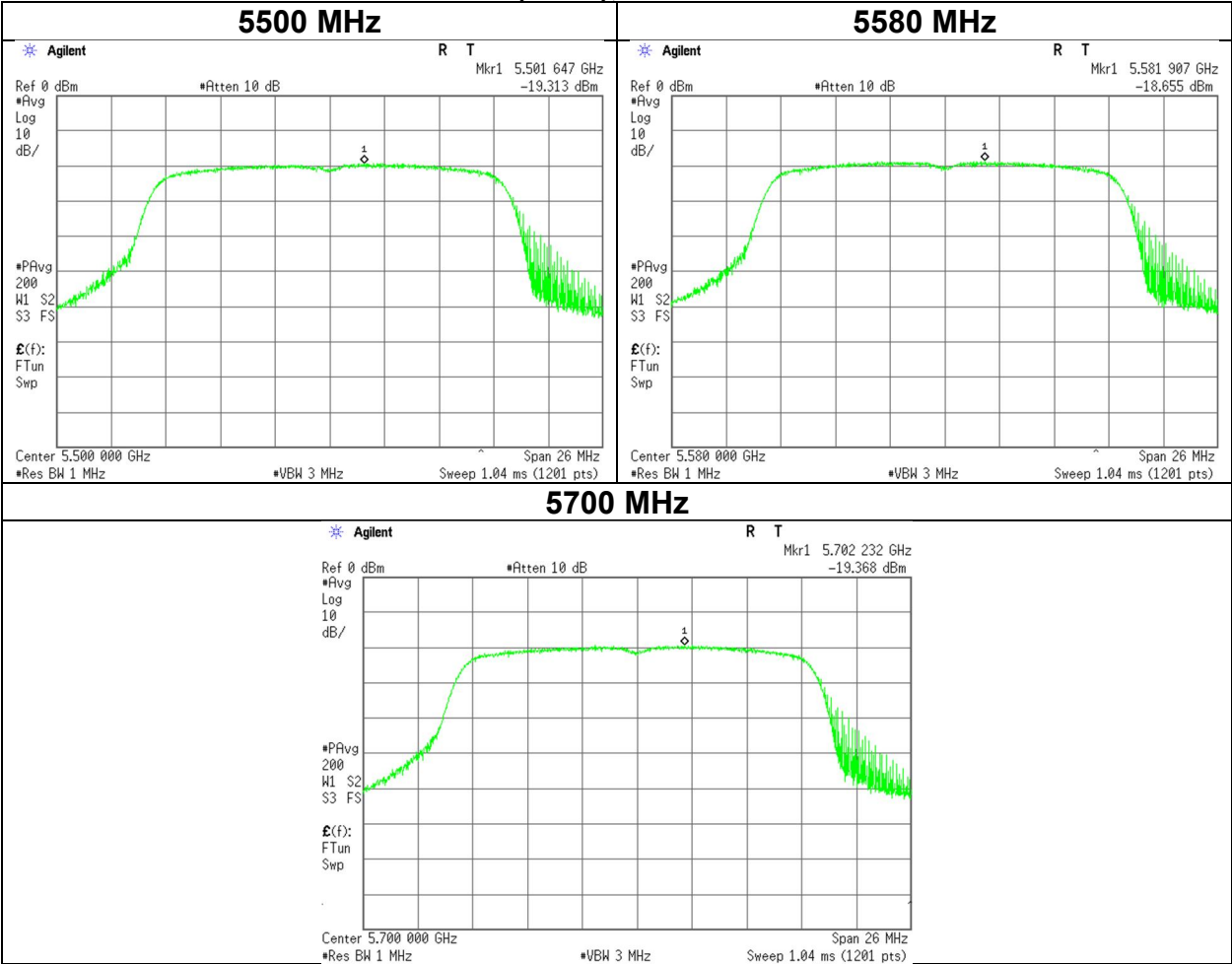
11a (SISO), Antenna 1



Maximum Power Spectral Density

Test place	Shonan EMC Lab. No.5 Shielded Room
Date	November 17, 2023
Temperature / Humidity	25 deg. C / 51 % RH
Engineer	Kouki Yamada
Mode	Tx 11a (SISO)

11a (SISO), Antenna 1



Maximum Power Spectral Density

Test place	Shonan EMC Lab. No.5 Shielded Room
Date	November 17, 2023
Temperature / Humidity	25 deg. C / 51 % RH
Engineer	Kouki Yamada
Mode	Tx 11a (SISO)

11a (SISO), Antenna 1

