

RADIO TEST REPORT

Test Report No. 15474876H-C-R2

Customer	DENSO CORPORATION
Description of EUT	Cockpit Control Unit
Model Number of EUT	DNNS125
FCC ID	HYQDNNS125
Test Regulation	FCC Part 15 Subpart E
Test Result	Complied
Issue Date	November 29, 2024
Remarks	-

Representative Test EngineerYuta Moriya
Engineer**Approved By**Ryota Yamanaka
Engineer

CERTIFICATE 5107.02

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

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REVISION HISTORY

Original Test Report No. 15474876H-C

This report is a revised version of 15474876H-C-R1. 15474876H-C-R1 is replaced with this report.

Revision	Test Report No.	Date	Page Revised Contents
- (Original)	15474876H-C	September 6, 2024	-
1	15474876H-C-R1	October 25, 2024	P.6 Correction of Antenna gain for 2.4 GHz band: WLAN: from 1.10 dBi to 1.78 dBi Bluetooth: from 1.10 dBi to 1.83 dBi
1	15474876H-C-R1	October 25, 2024	P.11 Correction of Tested Antenna as following Items - Radiated Spurious Emission (Below 1 GHz) from Chain 0 to 1 to Chain 0 + 1 - Radiated Spurious Emission (Above 1 GHz) Tx 11a from Chain 0 *2) to Tx 11a Chain 0 or 1 *2) Deletion of Operating Mode "Tx11n-40" from Radiated Spurious Emission (Above 1 GHz)
1	15474876H-C-R1	October 25, 2024	P.19 Addition of remark *6) and its note
1	15474876H-C-R1	October 25, 2024	P.20, P.33 Correction of 99 % Occupied Bandwidth data (Chain 0, 11a, 5240 MHz)
1	15474876H-C-R1	October 25, 2024	P.21, P.26, P.36 Replacement of 99 % Occupied Bandwidth data (Chain 1, 11-40, 5190 MHz and 5230 MHz)
1	15474876H-C-R1	October 25, 2024	P.26, 27 Correction of channel frequency from 5210 MHz to 5230 MHz from 5775 MHz to 5795 MHz
2	15474876H-C-R2	November 29, 2024	P.11 Deletion of table for Simultaneous Transmission

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	DENSO CORPORATION
Address	1-1 Showa-cho, Kariya-shi, Aichi ken, 448-8661 Japan
Telephone Number	+81-70-2236-5904
Contact Person	Naoto Makino

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	Cockpit Control Unit
Model Number	DNNS125
Serial Number	Refer to SECTION 4.2
Condition	Production prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification	No Modification by the test lab
Receipt Date	May 31, 2024
Test Date	June 18 to 27, 2024

2.2 Product Description

General Specification

Rating	DC 13.2 V
Operating temperature	-30 deg. C to 65 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.

WLAN (IEEE802.11b/11g/11n-20)

Equipment Type	Transceiver	
Frequency of Operation	2412 MHz to 2462 MHz	
Type of Modulation	DSSS, OFDM	
Antenna Gain ^{a)}	Main Antenna: Chain 0	Sub Antenna: Chain 1
	1.78 dBi	1.78 dBi

Bluetooth (BR / EDR)

Equipment Type	Transceiver	
Frequency of Operation	2402 MHz to 2480 MHz	
Type of Modulation	FHSS (GFSK, $\pi/4$ DQPSK, 8 DPSK)	
Antenna Type	External Antenna	
Antenna Gain ^{a)}	1.83 dBi	

WLAN (IEEE802.11a/11n-20/11ac-20/11n-40/11ac-40/11ac-80)

Equipment Type	Transceiver	
Frequency of Operation	20 MHz Band	5180 MHz to 5240 MHz 5745 MHz to 5825 MHz
	40 MHz Band	5190 MHz to 5230 MHz 5755 MHz to 5795 MHz
	80 MHz Band	5210 MHz 5775 MHz
Type of Modulation	OFDM	
Antenna Gain ^{a)}	Main Antenna: Chain 0	Sub Antenna: Chain 1
	0.30 dBi (5180 MHz to 5240 MHz) 0.99 dBi (5745 MHz to 5825 MHz)	0.30 dBi (5180 MHz to 5240 MHz) 0.99 dBi (5745 MHz to 5825 MHz)

AM/FM (incl. RDS)

Equipment Type	Receiver	
Frequency of Operation	522 kHz to 1710 kHz	
	87 MHz to 108 MHz	

FM tuner specification Intermediate frequency: 220 kHz

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: -	-	N/A	*2)
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	See data	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	11.2 dB 3509.1 MHz, PK, Vertical	Complied	Conducted (< 30 MHz) / Radiated (> 30 MHz) *3)
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 test is not applicable since the EUT is not the device that is designed to be connected to the public utility (AC) power line. *2) The test is not applicable since the EUT does not support W53 and W56 bands. *3) 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 stable voltage constantly to the wireless transmitter regardless of input voltage. Instead of a new battery, DC power supply was used for the test. 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 vehicle. 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 $k = 2$.

Radiated emission

Measurement distance	Frequency range		Unit	Calculated Uncertainty (+/-)
3 m	9 kHz to 30 MHz		dB	3.3
10 m			dB	3.1
3 m	30 MHz to 200 MHz	Horizontal	dB	4.7
		Vertical	dB	4.7
	200 MHz to 1000 MHz	Horizontal	dB	4.8
		Vertical	dB	6.0
10 m	30 MHz to 200 MHz	Horizontal	dB	5.2
		Vertical	dB	5.1
	200 MHz to 1000 MHz	Horizontal	dB	5.2
		Vertical	dB	5.2
3 m	1 GHz to 6 GHz		dB	5.0
	6 GHz to 18 GHz		dB	5.2
1 m	10 GHz to 18 GHz		dB	5.3
	18 GHz to 26.5 GHz		dB	5.2
	26.5 GHz to 40 GHz		dB	4.7
0.5 m	26.5 GHz to 40 GHz		dB	4.8

Antenna Terminal Conducted

Item	Unit	Calculated Uncertainty (+/-)
Antenna terminated conducted emission / Power density / Burst power	dB	3.47
Adjacent channel power (ACP)	dB	2.28
Bandwidth (OBW)	%	0.96
Time readout (time span upto 100 msec)	%	0.11
Time readout (time span upto 1000 msec)	%	0.11
Time readout (time span upto 60 sec)	%	0.02
Power measurement (Power meter < 8 GHz)	dB	1.46
Power measurement (Call box < 6 GHz)	dB	1.69
Frequency readout (Frequency counter)	ppm	0.67
Frequency readout (Spectrum analyzer frequency readout function)	ppm	2.13
Temperature (constant temperature bath)	deg. C	0.69
Humidity (constant temperature bath)	%RH	2.98
Modulation characteristics	%	6.93
Frequency for mobile	ppm	0.08
Contention-based protocol	dB	2.26

3.5 Test Location

UL Japan, Inc. Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 Japan

Telephone: +81-596-24-8999

A2LA Certificate Number: 5107.02 / FCC Test Firm Registration Number: 884919

ISED Lab Company Number: 2973C / CAB identifier: JP0002

Test site	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms	Maximum measurement distance
No.1 semi-anechoic chamber	19.2 x 11.2 x 7.7	7.0 x 6.0	No.1 Power source room	10 m
No.2 semi-anechoic chamber	7.5 x 5.8 x 5.2	4.0 x 4.0	-	3 m
No.3 semi-anechoic chamber	12.0 x 8.5 x 5.9	6.8 x 5.75	No.3 Preparation room	3 m
No.3 shielded room	4.0 x 6.0 x 2.7	N/A	-	-
No.4 semi-anechoic chamber	12.0 x 8.5 x 5.9	6.8 x 5.75	No.4 Preparation room	3 m
No.4 shielded room	4.0 x 6.0 x 2.7	N/A	-	-
No.5 semi-anechoic chamber	6.0 x 6.0 x 3.9	6.0 x 6.0	-	-
No.5 measurement room	6.4 x 6.4 x 3.0	6.4 x 6.4	-	-
No.6 shielded room	4.0 x 4.5 x 2.7	4.0 x 4.5	-	-
No.6 measurement room	4.75 x 5.4 x 3.0	4.75 x 4.15	-	-
No.7 shielded room	4.7 x 7.5 x 2.7	4.7 x 7.5	-	-
No.8 measurement room	3.1 x 5.0 x 2.7	3.1 x 5.0	-	-
No.9 measurement room	8.8 x 4.6 x 2.8	2.4 x 2.4	-	-
No.10 shielded room	3.8 x 2.8 x 2.8	3.8 x 2.8	-	-
No.11 measurement room	4.0 x 3.4 x 2.5	N/A	-	-
No.12 measurement room	2.6 x 3.4 x 2.5	N/A	-	-
Large Chamber	16.9 x 22.1 x 10.17	16.9 x 22.1	-	10 m
Small Chamber	5.3 x 6.69 x 3.59	5.3 x 6.69	-	-

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*
IEEE 802.11a (11a)	18 Mbps, PN9
IEEE 802.11n MIMO 20 MHz BW (11n-20)	MCS 10, PN9
IEEE 802.11ac MIMO 20 MHz BW (11ac-20)	MCS 2, PN9
IEEE 802.11n MIMO 40 MHz BW (11n-40)	MCS 8, PN9
IEEE 802.11ac MIMO 40 MHz BW (11ac-40)	MCS 0, PN9
IEEE 802.11ac MIMO 80 MHz BW (11ac-80)	MCS 2, PN9
*The worst antenna 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 11a: 7.5 dBm Setting: 11n-20: 6.5 dBm 11ac-20: (MCS 0 to MCS 7) 6.5 dBm / (MCS 8): 5.5 dBm 11n-40: 5.5 dBm 11ac-40: (MCS 0 to MCS 7) 5.5 dBm / (MCS 8 to MCS 9) 5.5 dBm 11ac-80: (MCS 0 to MCS 7) 4.5 dBm / (MCS 8 to MCS 9) 2.5 dBm Software: MSoC Version: .F67WHM010-708 (Date: November 12, 2020, Storage location: EUT memory) *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.	

*The Details of Operation Mode(s)

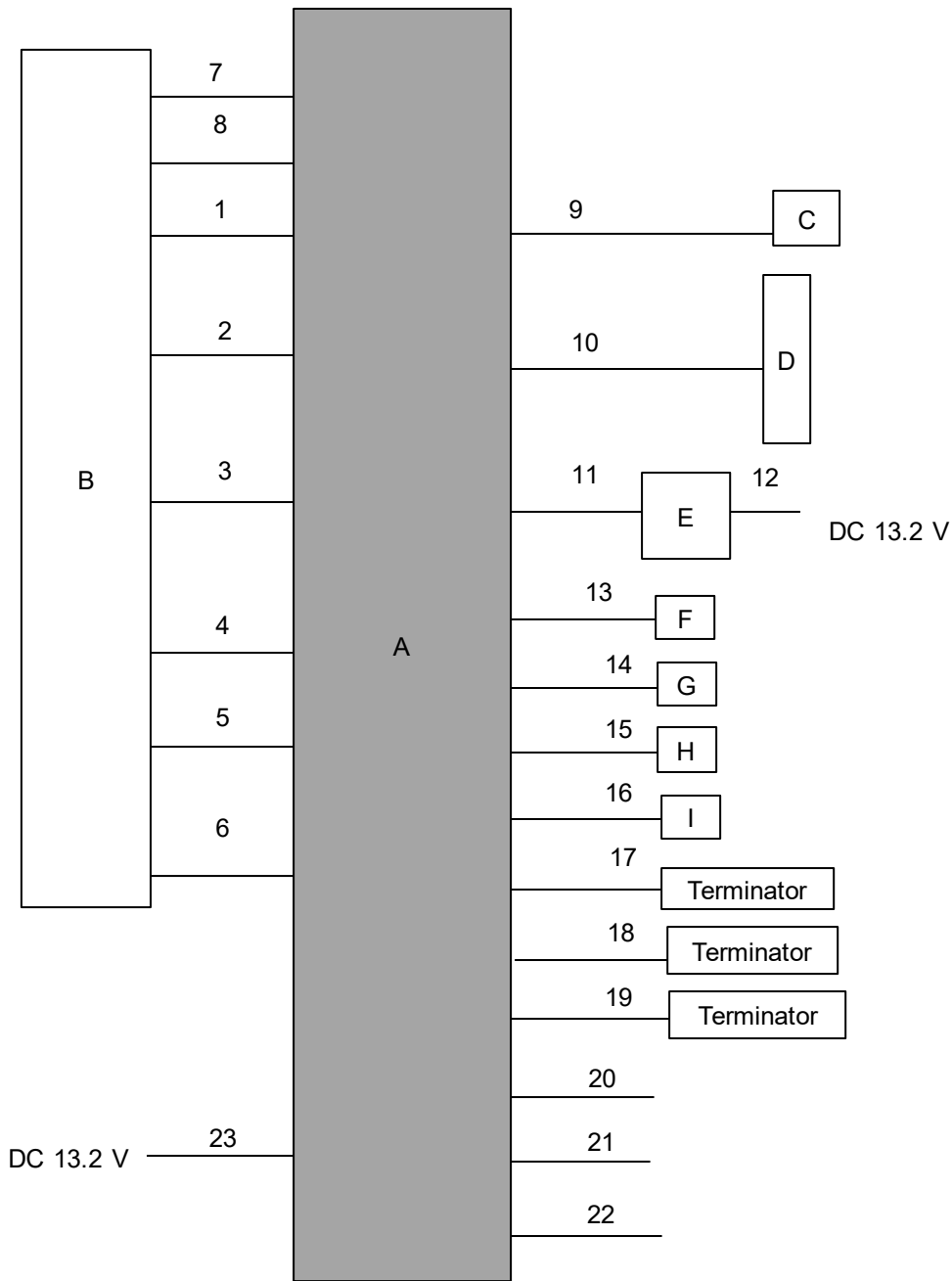
Test Item	Operating Mode	Tested Antenna	Tested Frequency	
			Lower Band	Upper Band
99 % Occupied Bandwidth	Tx 11a	Chain 0 Chain 1	5180 MHz 5220 MHz 5240 MHz	5745 MHz 5785 MHz 5825 MHz
	Tx 11n-20 Tx 11ac-20	Chain 0 or 1 *1)	5180 MHz 5220 MHz 5240 MHz	5745 MHz 5785 MHz 5825 MHz
	Tx 11n-40 Tx 11ac-40	Chain 0 or 1 *1)	5190 MHz 5230 MHz	5755 MHz 5795 MHz
	Tx 11ac-80	Chain 0 or 1 *1)	5210 MHz	5775 MHz
6 dB Bandwidth	Tx 11a Tx 11n-20 Tx 11ac-20	Chain 0 *1)	-	5745 MHz 5785 MHz 5825 MHz
	Tx 11n-40 Tx 11ac-40	Chain 0 *1)	-	5755 MHz 5795 MHz
	Tx 11ac-80	Chain 0 *1)	-	5775 MHz
Maximum Conducted Output Power, Maximum Power Spectral Density	Tx 11a	Chain 0 and 1	5180 MHz 5220 MHz 5240 MHz	5745 MHz 5785 MHz 5825 MHz
	Tx 11n-20 Tx 11ac-20	Chain 0 + 1	5180 MHz 5220 MHz 5240 MHz	5745 MHz 5785 MHz 5825 MHz
	Tx 11n-40 Tx 11ac-40	Chain 0 + 1	5190 MHz 5230 MHz	5755 MHz 5795 MHz
	Tx 11ac-80	Chain 0 + 1	5210 MHz	5775 MHz
Radiated Spurious Emission (Below 1 GHz),	Tx 11ac-20	Chain 0 + 1	5220 MHz	-
Radiated Spurious Emission (Above 1 GHz)	Tx 11a	Chain 0 or 1 *2)	5180 MHz 5220 MHz 5240 MHz	5745 MHz 5785 MHz 5825 MHz
	Tx 11ac-20	Chain 0 + 1	5180 MHz 5220 MHz 5240 MHz	5745 MHz 5785 MHz 5825 MHz
	Tx 11ac-40	Chain 0 + 1	5190 MHz 5230 MHz	5755 MHz 5795 MHz
	Tx 11ac-80	Chain 0 + 1	5210 MHz	5775 MHz
Conducted Spurious Emission	Tx 11ac-20	Chain 1 *1)	5220 MHz	-

*1) The tested antenna was determined based on the test result of Maximum Conducted Output Power.

*2) The tested antenna was determined based on the test result of Maximum Conducted Output Power (e.i.r.p).

4.2 Configuration and Peripherals

For Radiated Emission



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

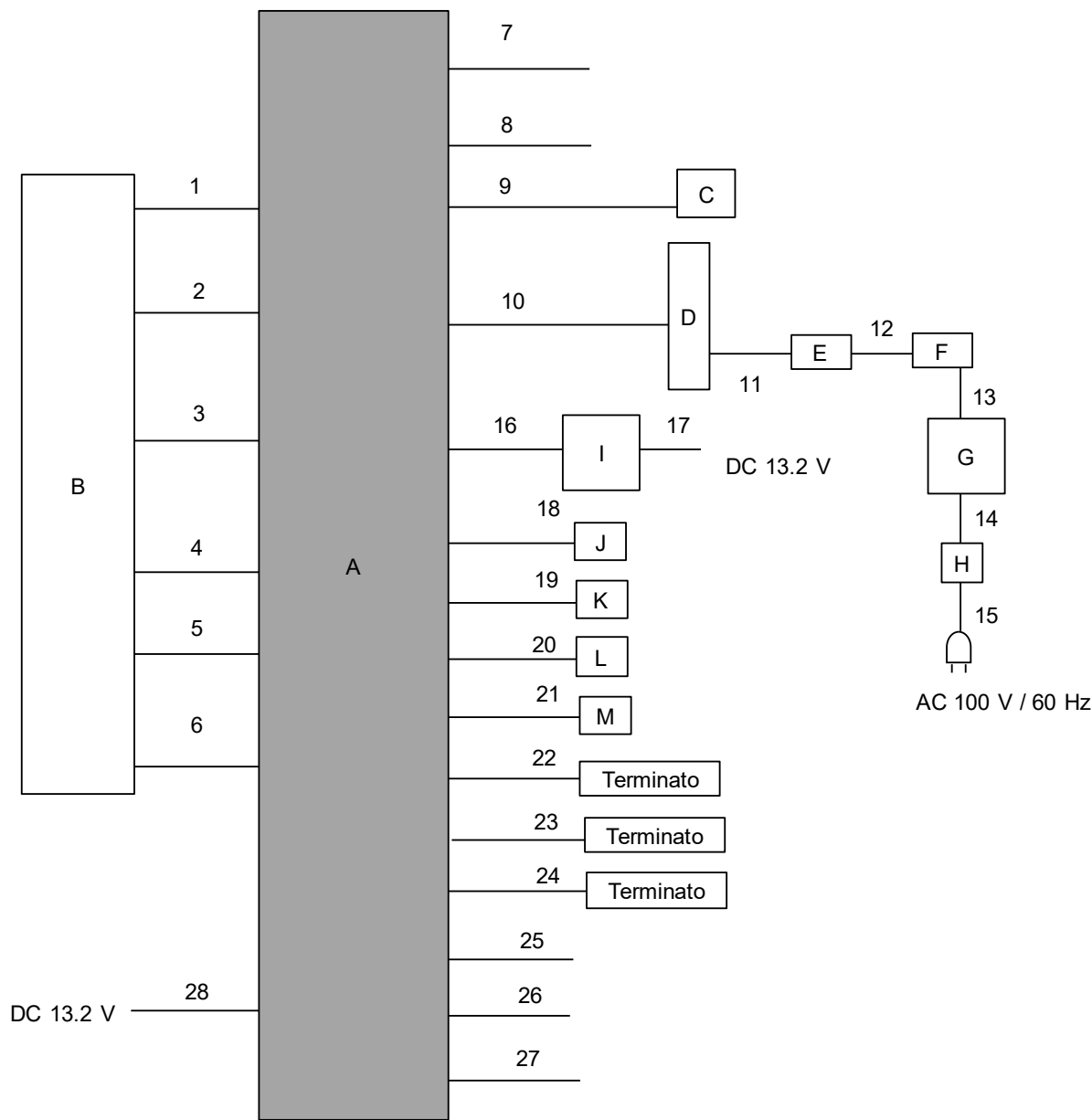
Description of EUT and Support Equipment

No.	Item	Model number	Serial Number	Manufacturer	Remarks
A	Cockpit Control Unit	DNNS125	0468726400500243000 00000	DENSO CORPORATION	EUT
B	Display (CID)	DNNS132-2	86412FN450	DENSO CORPORATION	-
C	Mic	-	-	Panasonic	-
D	USB BOX	86257AN00A	No.7	SUBARU	-
E	Meter	TN257550-6773	85002AN02A	DENSO CORPORATION	-
F	Speaker	SPEAKER ASSY 4FD	-	FOSTER	-
G	Speaker	SPEAKER ASSY 4FD	-	FOSTER	-
H	Speaker	SPEAKER ASSY 4RD	-	FOSTER	-
I	Speaker	SPEAKER ASSY 4RD	-	FOSTER	-

List of Cables Used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	DC Cable	0.2	Unshielded	Unshielded	-
2	Signal Cable	0.2	Unshielded	Unshielded	-
3	GND Cable	0.2	Unshielded	Unshielded	-
4	GND Cable	0.2	Unshielded	Unshielded	-
5	GND Cable	0.2	Unshielded	Unshielded	-
6	GND Cable	0.2	Unshielded	Unshielded	-
7	RF Cable	0.1	Shielded	Shielded	-
8	RF Cable	0.1	Shielded	Shielded	-
9	Mic Cable	1.0	Unshielded	Unshielded	-
10	Signal Cable	0.5	Unshielded	Unshielded	-
11	Signal Cable	1.0	Unshielded	Unshielded	-
12	DC Cable	2.5	Unshielded	Unshielded	-
13	Speaker Cable	2.0	Unshielded	Unshielded	-
14	Speaker Cable	2.0	Unshielded	Unshielded	-
15	Speaker Cable	2.0	Unshielded	Unshielded	-
16	Speaker Cable	2.0	Unshielded	Unshielded	-
17	Antenna Cable	1.5	Shielded	Shielded	-
18	Antenna Cable	1.5	Shielded	Shielded	-
19	Antenna Cable	1.0	Shielded	Shielded	-
20	Signal Cable	1.0	Unshielded	Unshielded	-
21	Signal Cable	1.0	Unshielded	Unshielded	-
22	Signal Cable	1.0	Unshielded	Unshielded	-
23	DC Cable	2.5	Unshielded	Unshielded	-

For Antenna Terminal Conducted 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	Cockpit Control Unit	DNNS125	046872640050024330 100091	DENSO CORPORATION	EUT
B	Display (CID)	DNNS132-2	86412FN450	DENSO CORPORATION	-
C	Mic	-	-	Panasonic	-
D	USB BOX	86257AN00A	No.7	SUBARU	-
E	USB-LAN Adapter	LUA3-U2-ATX	26495680506450	BUFFALO INC.	-
F	USB-LAN Adapter	LUA3-U2-ATX	26495680506351	BUFFALO INC.	-
G	Laptop PC	PR63PBAA337AD7X	6F053983H	TOSHIBA	-
H	AC Adapter	PA51770-1ACA	G71C000GZ120	TOSHIBA	-
I	Meter	TN257550-6773	85002AN02A	DENSO CORPORATION	-
J	Speaker	SPEAKER ASSY 4FD	-	FOSTER	-
K	Speaker	SPEAKER ASSY 4FD	-	FOSTER	-
L	Speaker	SPEAKER ASSY 4RD	-	FOSTER	-
M	Speaker	SPEAKER ASSY 4RD	-	FOSTER	-

List of Cables Used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	DC Cable	0.2	Unshielded	Unshielded	-
2	Signal Cable	0.2	Unshielded	Unshielded	-
3	GND Cable	0.2	Unshielded	Unshielded	-
4	GND Cable	0.2	Unshielded	Unshielded	-
5	GND Cable	0.2	Unshielded	Unshielded	-
6	GND Cable	0.2	Unshielded	Unshielded	-
7	RF Cable	0.1	Shielded	Shielded	-
8	RF Cable	0.1	Shielded	Shielded	-
9	Mic Cable	1.0	Unshielded	Unshielded	-
10	Signal Cable	0.5	Unshielded	Unshielded	-
11	USB Cable	0.2	Shielded	Shielded	-
12	LAN Cable	1.5	Unshielded	Unshielded	-
13	USB Cable	0.2	Shielded	Shielded	-
14	DC Cable	1.3	Unshielded	Unshielded	-
15	AC Cable	0.8	Unshielded	Unshielded	-
16	Signal Cable	1.0	Unshielded	Unshielded	-
17	DC Cable	2.5	Unshielded	Unshielded	-
18	Speaker Cable	2.0	Unshielded	Unshielded	-
19	Speaker Cable	2.0	Unshielded	Unshielded	-
20	Speaker Cable	2.0	Unshielded	Unshielded	-
21	Speaker Cable	2.0	Unshielded	Unshielded	-
22	Antenna Cable	1.5	Shielded	Shielded	-
23	Antenna Cable	1.5	Shielded	Shielded	-
24	Antenna Cable	1.0	Shielded	Shielded	-
25	Signal Cable	1.0	Unshielded	Unshielded	-
26	Signal Cable	1.0	Unshielded	Unshielded	-
27	Signal Cable	1.0	Unshielded	Unshielded	-
28	DC Cable	2.5	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 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 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 5.8 GHz band 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:

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

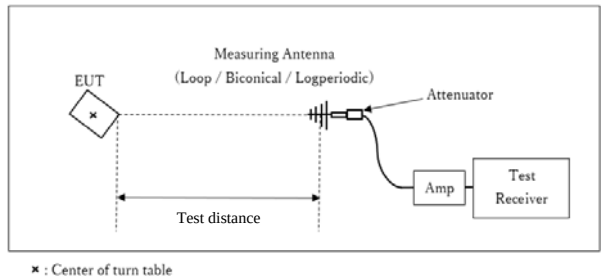
Test Antennas are used as below;

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 RBW: 1 MHz VBW: 1/T MHz Detector: Peak Trace: Max hold

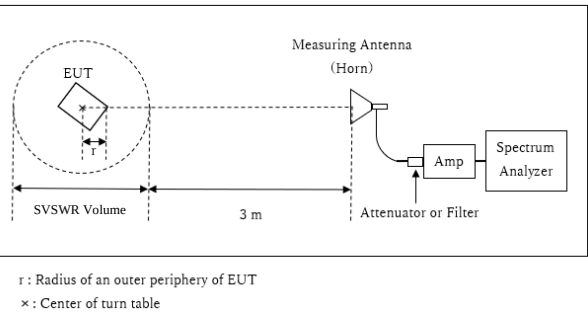
Figure 1: Test Setup

Below 1 GHz



Test Distance: 3 m

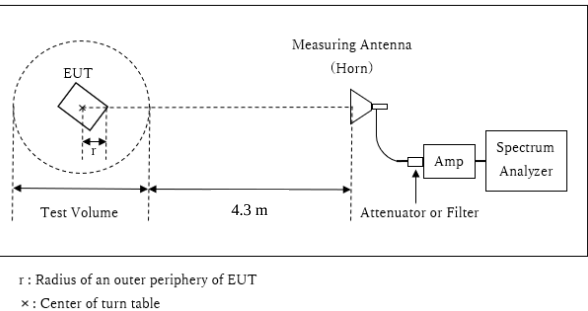
1 GHz to 6 GHz



Distance Factor: $20 \times \log (3.8 \text{ m} / 3.0 \text{ m}) = 2.06 \text{ dB}$
* Test Distance: $(3 + \text{SVSWR Volume} / 2) - r = 3.8 \text{ m}$

SVSWR Volume : 2.0 m
(SVSWR Volume has been calibrated based on CISPR 16-1-4.)
 $r = 0.2 \text{ m}$

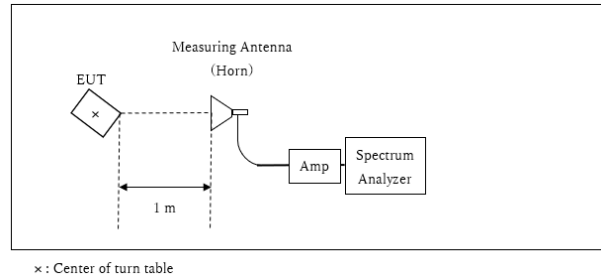
6 GHz to 10 GHz



Distance Factor: $20 \times \log (4.8 \text{ m} / 3.0 \text{ m}) = 4.09 \text{ dB}$
* Test Distance: $(4.3 + \text{SVSWR Volume} / 2) - r = 4.8 \text{ m}$

SVSWR Volume : 1.4 m
(SVSWR Volume has been calibrated based on CISPR 16-1-4.)
 $r = 0.2 \text{ m}$

10 GHz to 40 GHz



Distance Factor: $20 \times \log (1.0 \text{ m} / 3.0 \text{ m}) = -9.5 \text{ dB}$
*Test Distance: 1 m

The test was made on EUT at the normal use position.

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: 80 MHz BW) (Method PM-G)
Maximum Power Spectral Density	Encompass the entire EBW	1 MHz or 470 kHz *2)	≥ 3 RBW	≤ (number of points in sweep) × T *5) *6)	RMS Power Averaging	Max Hold	Spectrum Analyzer
Conducted Spurious Emission*3) *4)	9 kHz to 150 kHz	200 Hz	620 Hz	Auto	Peak	Max Hold	Spectrum Analyzer
	150 kHz to 30 MHz	10 kHz	30 kHz				

*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 ($10 \log(500 \text{ kHz} / 470 \text{ kHz})$) 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.

*5) T refers to the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

*6) The SA-3 of KDB 789033 was used for the measurement.

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

99 % Occupied Bandwidth

Test place
Date
Temperature / Humidity
Engineer
Mode

Ise EMC Lab. No.3 Measurement Room
June 21, 2024
22 deg. C / 65 % RH
Junya Okuno
Tx

11a

Antenna	Tested Frequency [MHz]	99 % Occupied Bandwidth [kHz]
Chain 0	5180	16231.6
	5220	16241.5
	5240	16219.2
	5745	16230.9
	5785	16222.4
	5825	16235.6

11a

Antenna	Tested Frequency [MHz]	99 % Occupied Bandwidth [kHz]
Chain 1	5180	16238.7
	5220	16221.8
	5240	16234.7
	5745	16221.6
	5785	16230.1
	5825	16238.0

11n-20

Antenna	Tested Frequency [MHz]	99 % Occupied Bandwidth [kHz]
Chain 1	5180	17375.4
	5220	17381.4
	5240	17371.4
Chain 0	5745	17380.7
	5785	17376.4
	5825	17354.4

11ac-20

Antenna	Tested Frequency [MHz]	99 % Occupied Bandwidth [kHz]
Chain 1	5180	17381.4
	5220	17356.8
	5240	17381.2
Chain 0	5745	17351.8
	5785	17347.6
	5825	17342.7

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place
Date
Temperature / Humidity
Engineer
Mode

Ise EMC Lab. No.3 Measurement Room
June 21, 2024
22 deg. C / 65 % RH
Junya Okuno
Tx

11n-40

Antenna	Tested Frequency [MHz]	99 % Occupied Bandwidth [kHz]
Chain 1	5190	35752.8
	5230	35799.4
Chain 0	5755	35770.6
	5795	35718.8

11ac-40

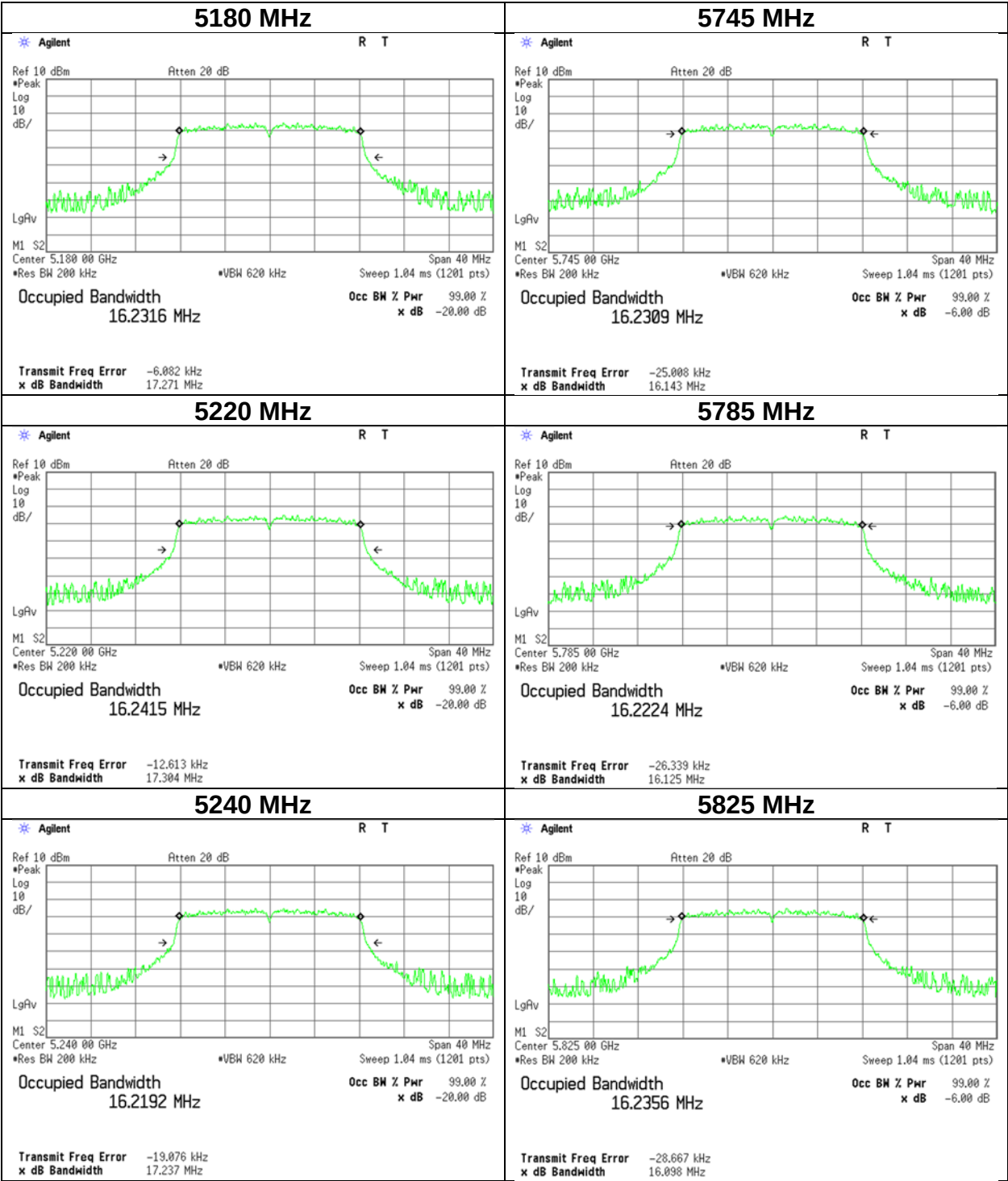
Antenna	Tested Frequency [MHz]	99 % Occupied Bandwidth [kHz]
Chain 1	5190	35732.3
	5230	35700.2
Chain 0	5755	35754.3
	5795	35713.5

11ac-80

Antenna	Tested Frequency [MHz]	99 % Occupied Bandwidth [kHz]
Chain 1	5210	74955.9
Chain 0	5775	74811.4

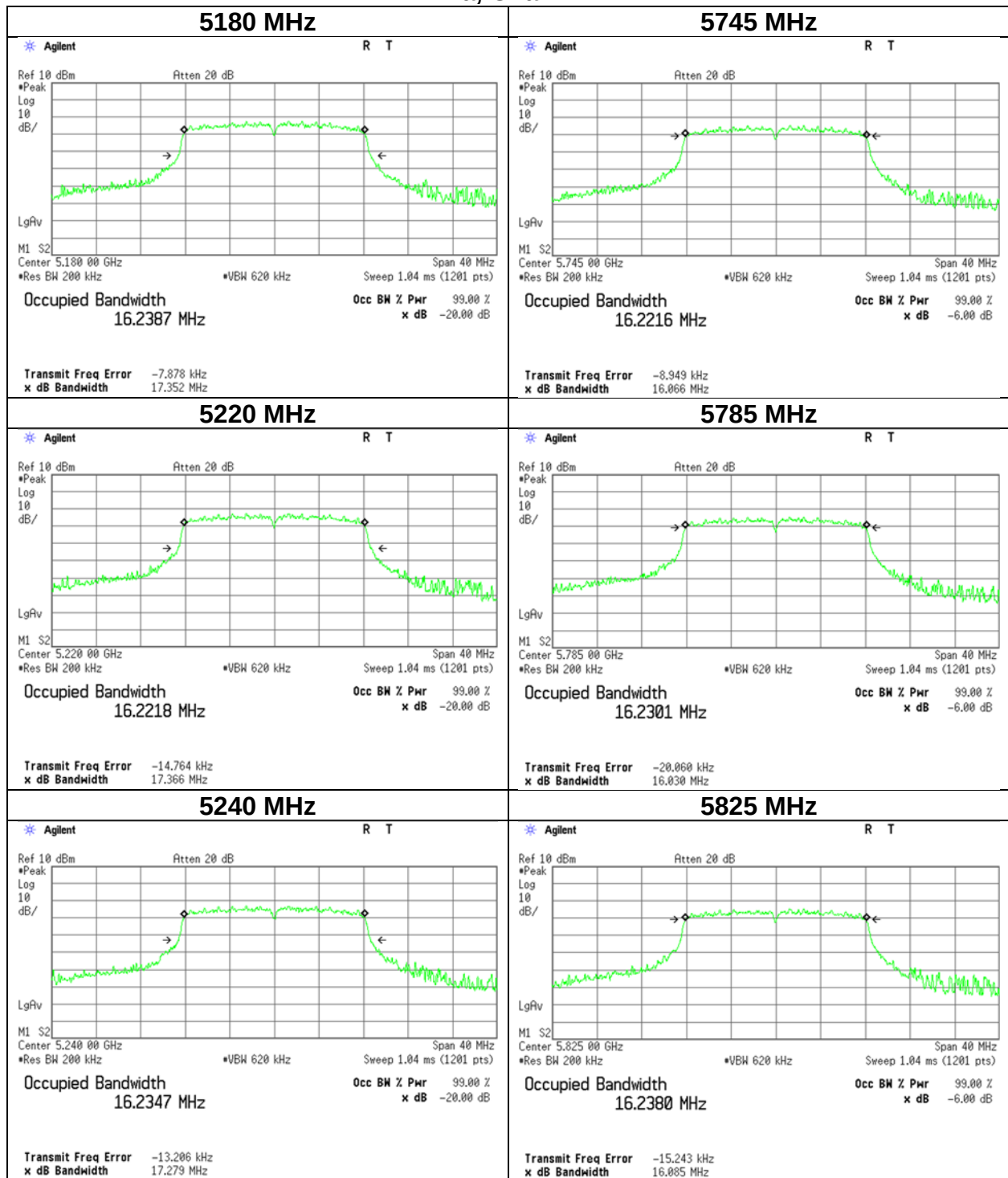
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11a, Chain 0



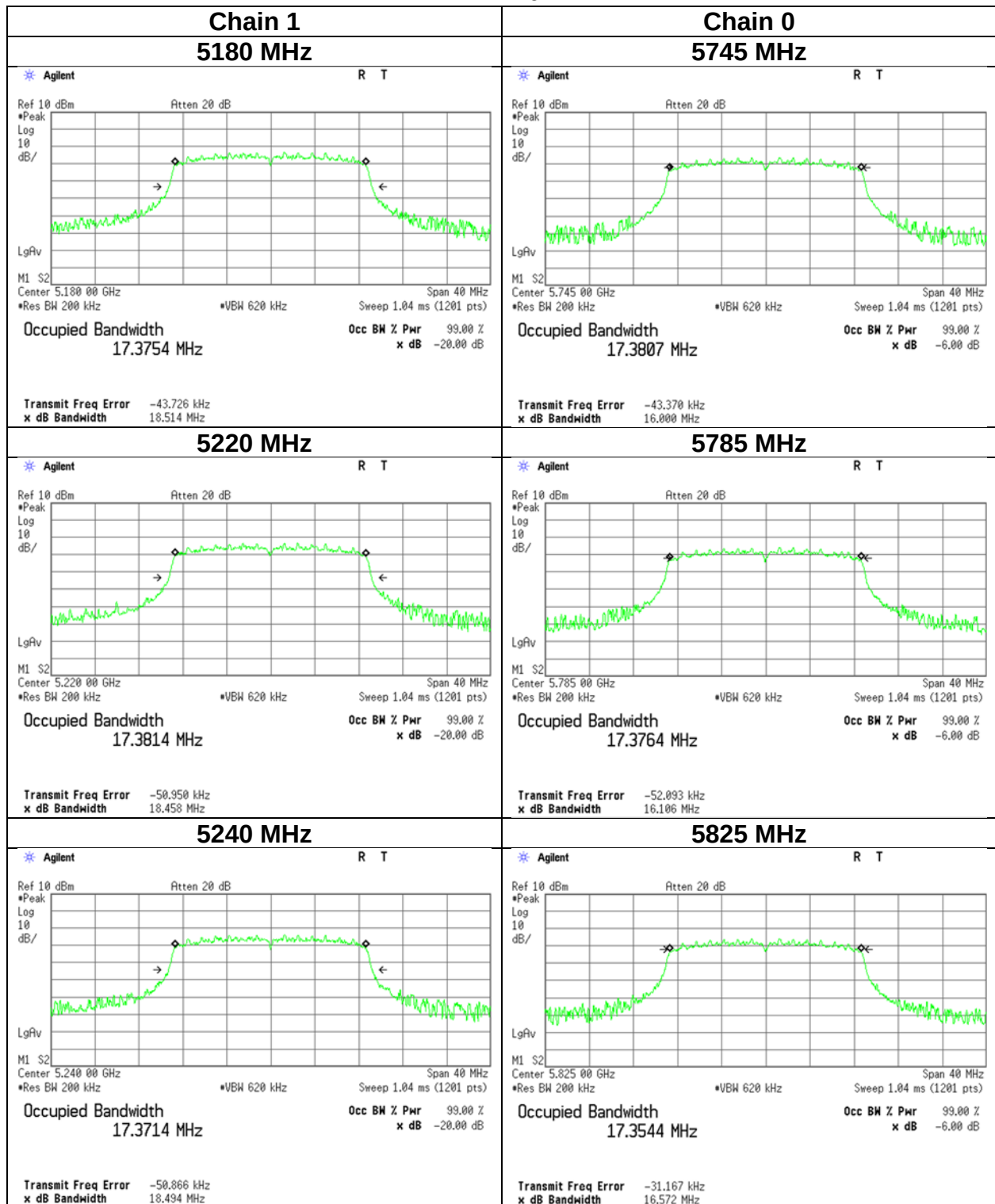
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11a, Chain 1



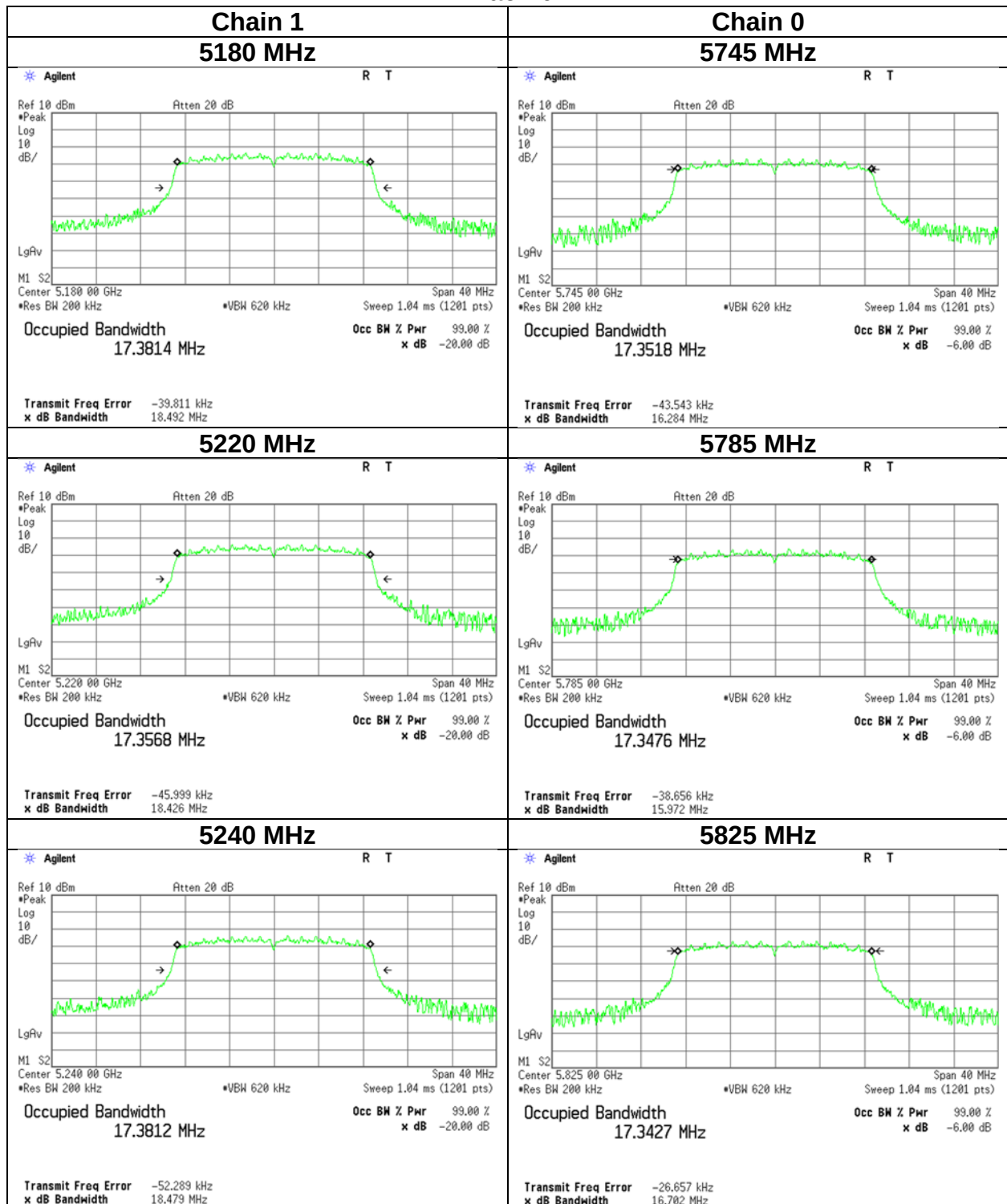
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11n-20



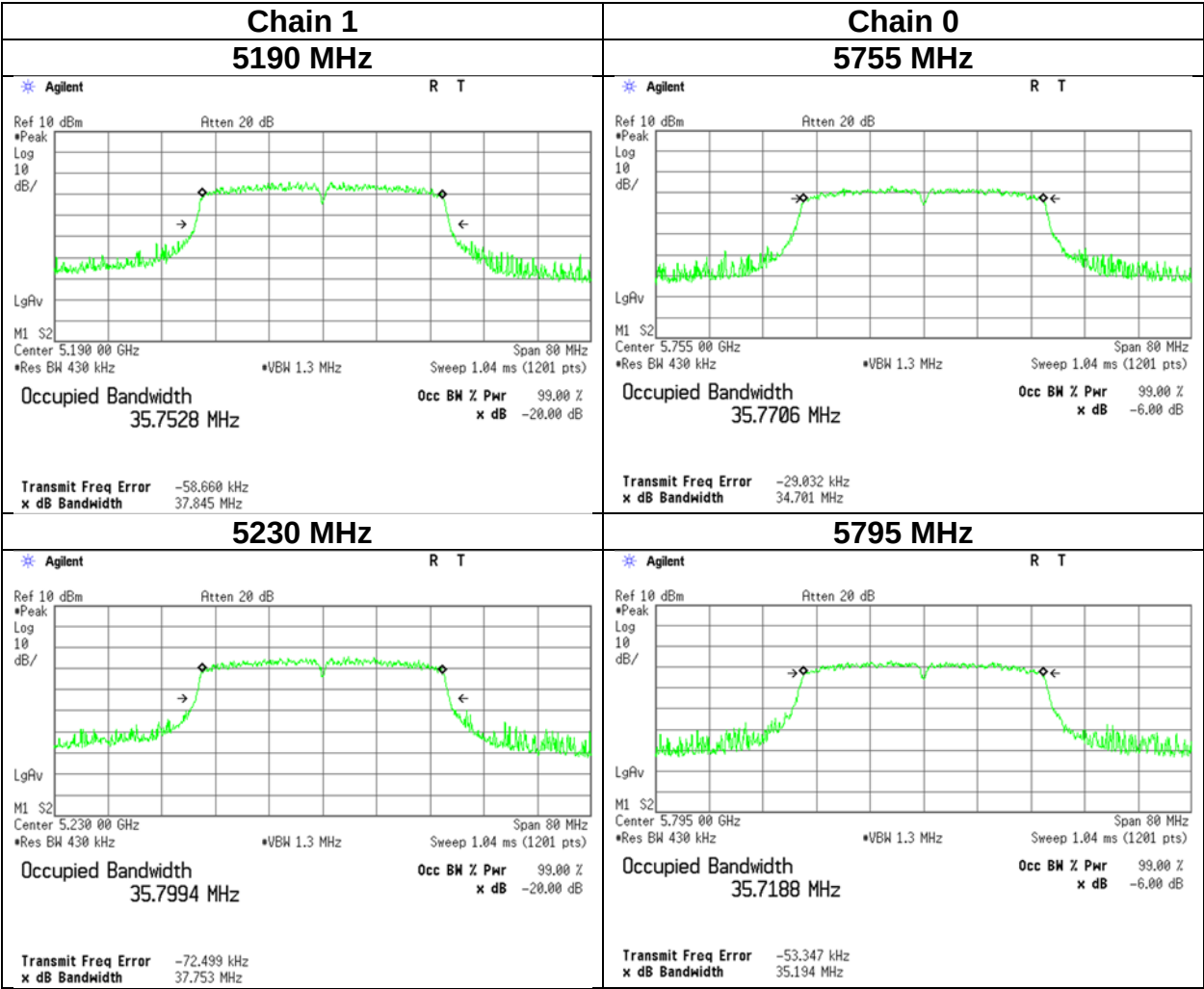
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ac-20



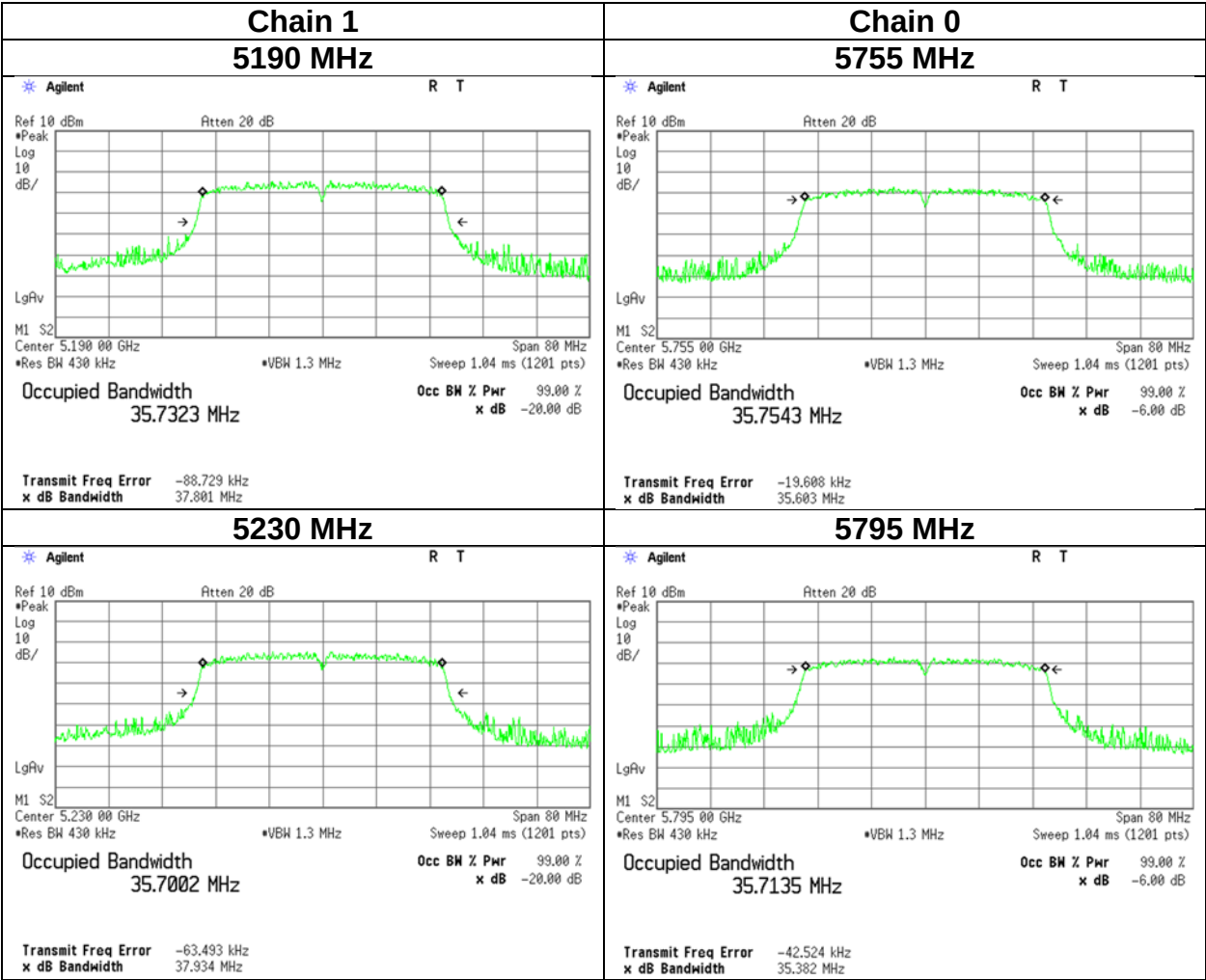
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11n-40



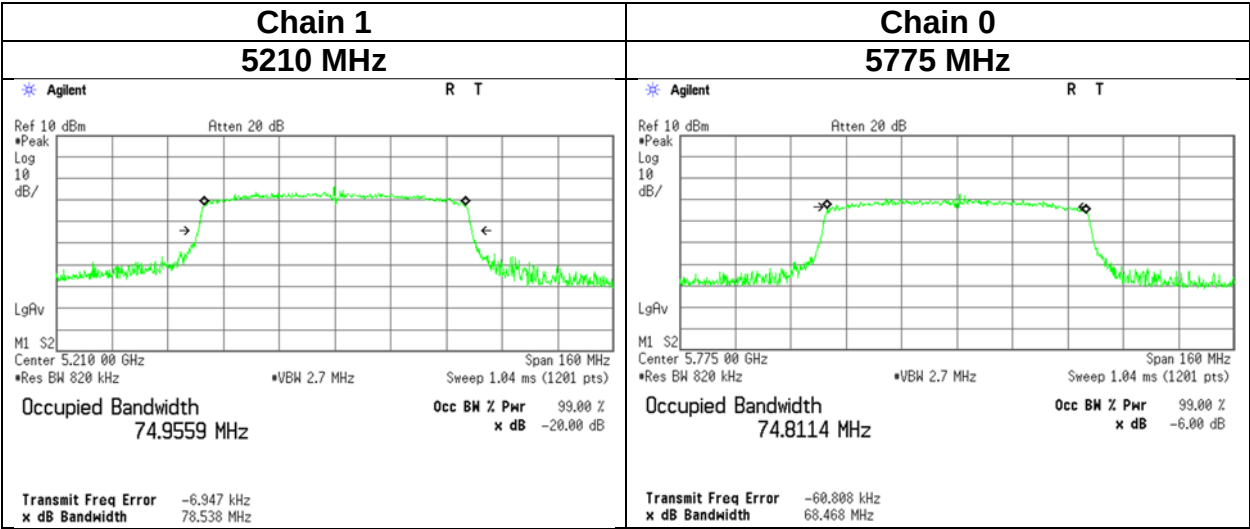
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ac-40



26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ac-80



6 dB Bandwidth

Test place
Date
Temperature / Humidity
Engineer
Mode

Ise EMC Lab. No.3 Measurement Room
June 21, 2024
22 deg. C / 65 % RH
Junya Okuno
Tx

11a

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]
Chain 0	5745	15.148	> 0.500
	5785	15.145	> 0.500
	5825	15.334	> 0.500

11n-20

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]
Chain 0	5745	15.169	> 0.500
	5785	15.164	> 0.500
	5825	15.167	> 0.500

11ac-20

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]
Chain 0	5745	15.168	> 0.500
	5785	15.179	> 0.500
	5825	15.164	> 0.500

11n-40

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]
Chain 0	5755	35.182	> 0.500
	5795	35.172	> 0.500

11ac-40

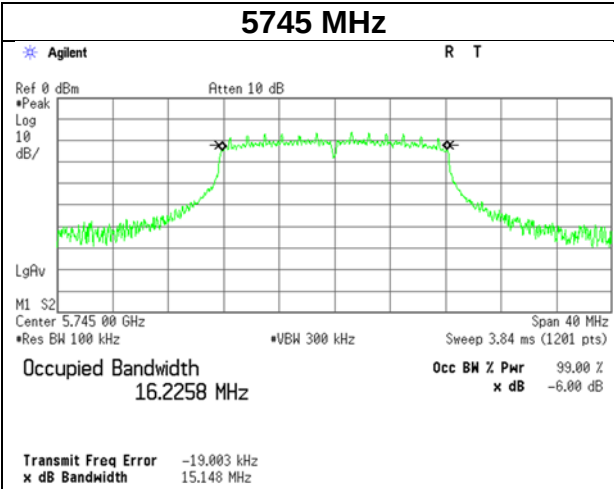
Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]
Chain 0	5755	35.170	> 0.500
	5795	35.128	> 0.500

11ac-80

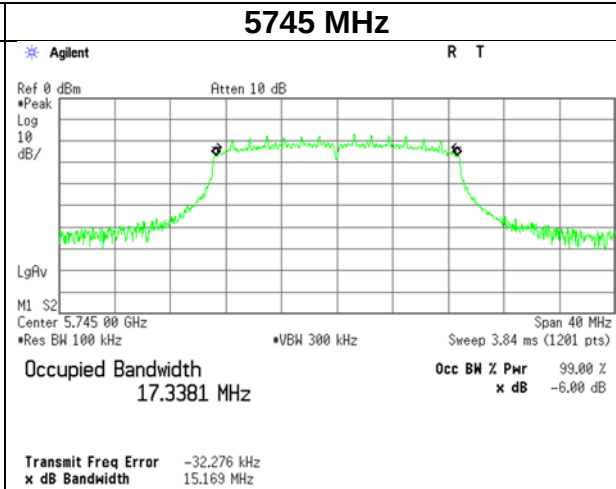
Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]
Chain 0	5775	75.192	> 0.500

6 dB Bandwidth

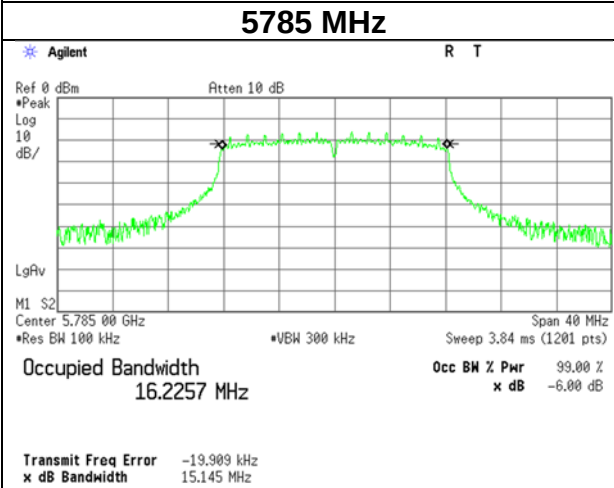
11a, Chain 0
5745 MHz



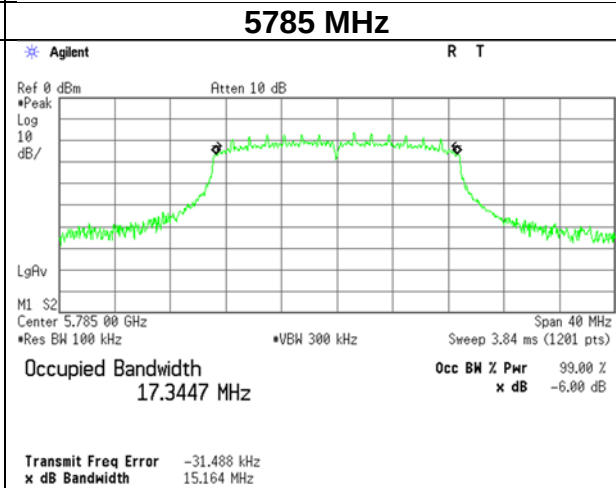
11n-20, Chain 0
5745 MHz



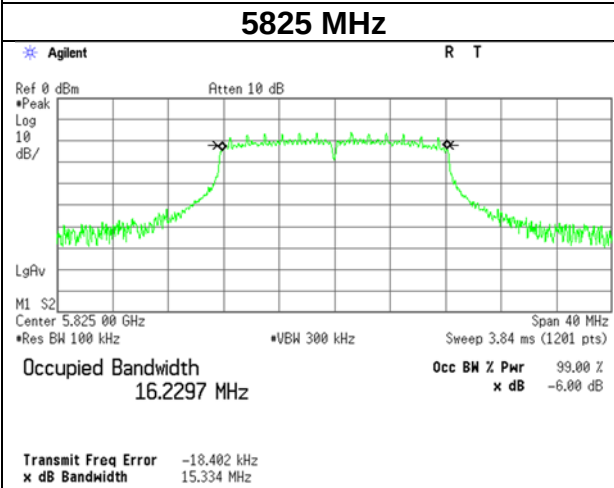
5785 MHz



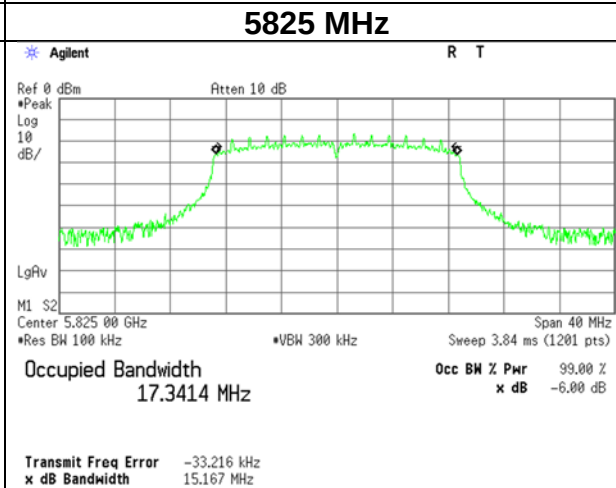
5785 MHz



5825 MHz

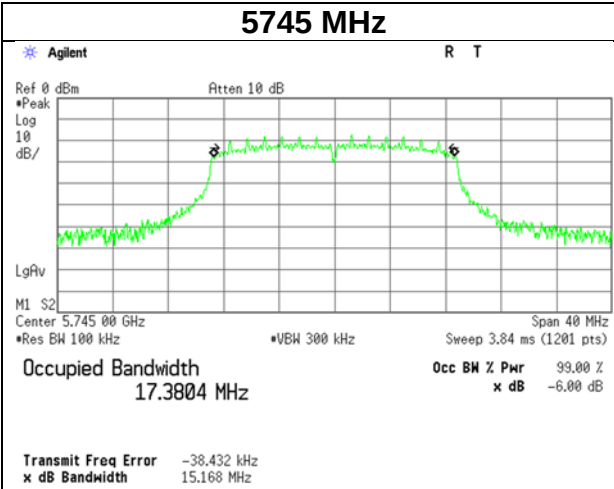


5825 MHz

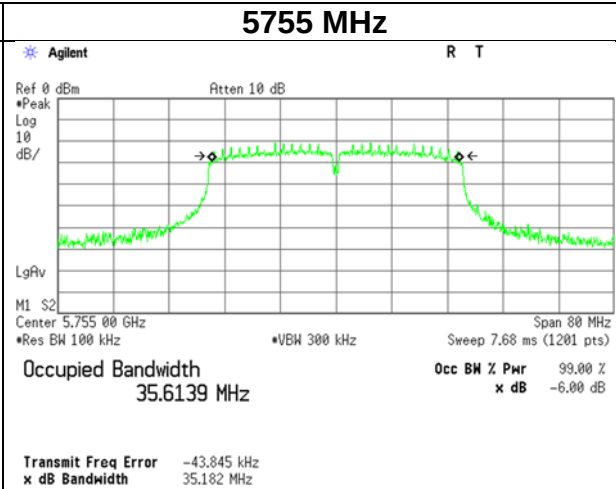


6 dB Bandwidth

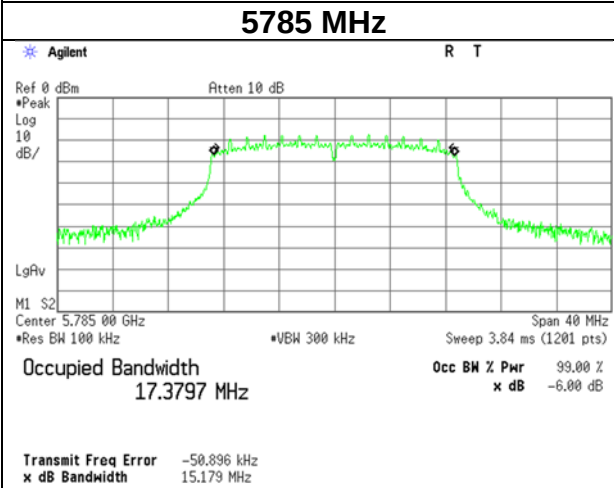
11ac-20, Chain 0
5745 MHz



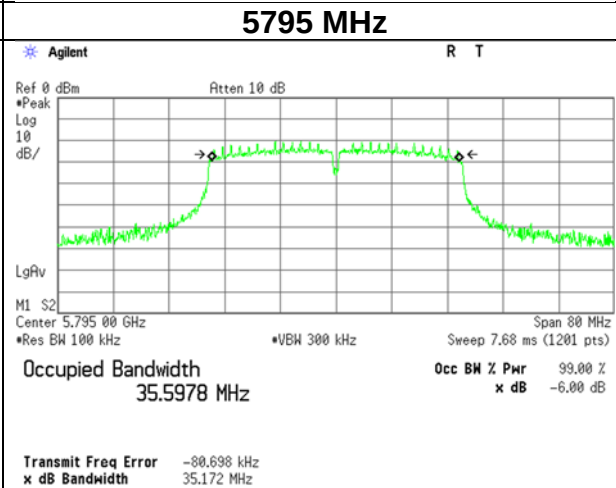
11n-40, Chain 0
5755 MHz



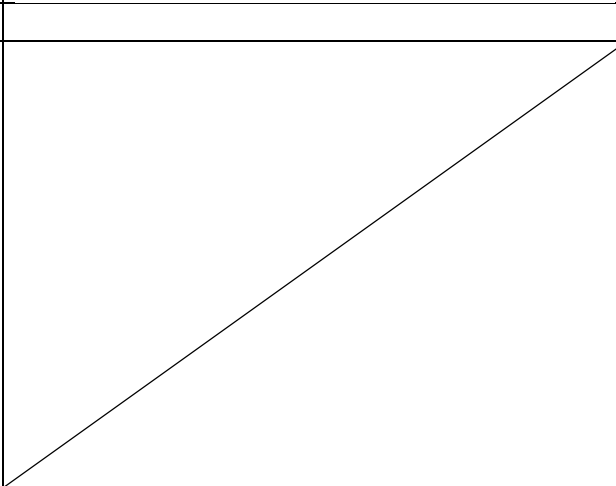
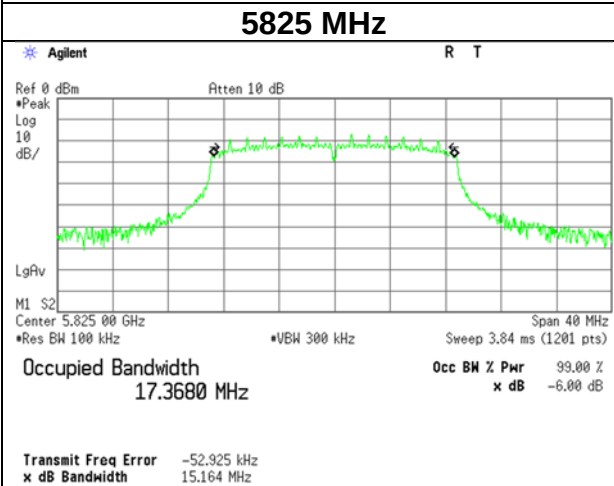
5785 MHz



5795 MHz

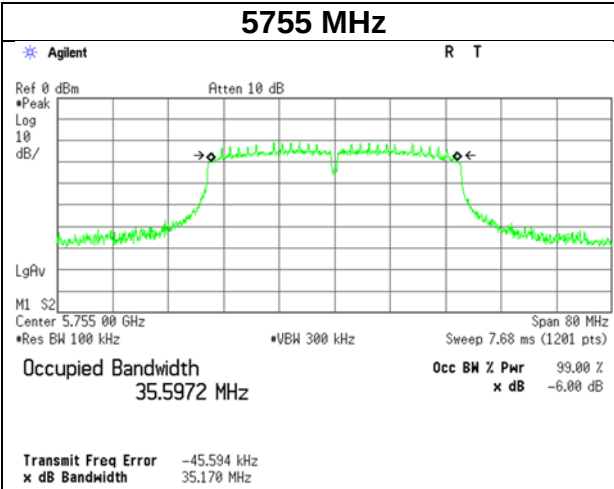


5825 MHz

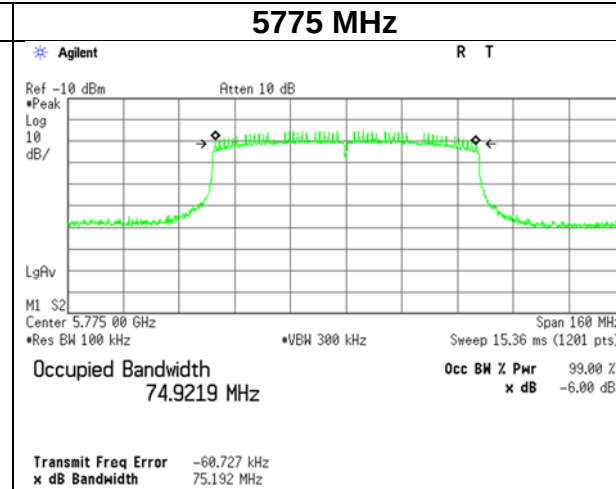


6 dB Bandwidth

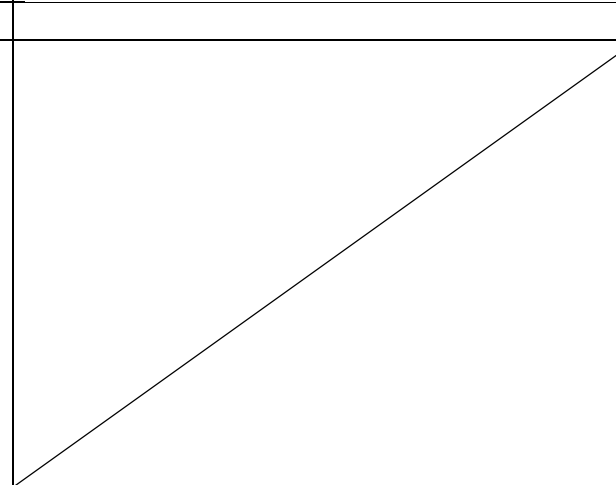
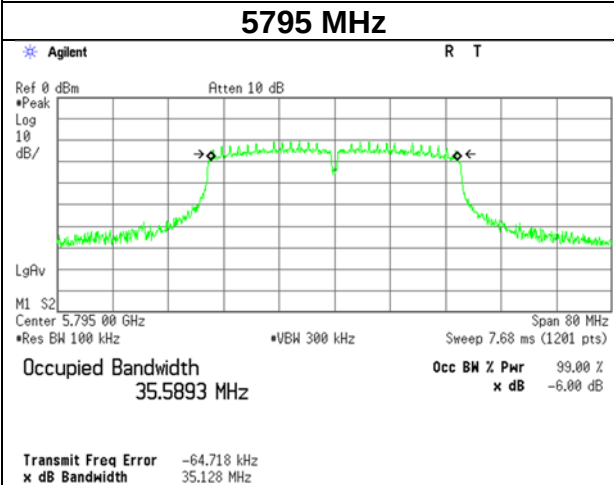
11ac-40, Chain 0
5755 MHz



11ac-80, Chain 0
5775 MHz



5795 MHz



Maximum Conducted Output Power

Test place: Ise EMC Lab. No.3 Measurement Room
Date: June 20, 2024
Temperature / Humidity: 23 deg. C / 60 % RH
Engineer: Junya Okuno
Mode: Tx 11a

Chain 0

11a

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	99% OBW (B for IC) [MHz]	Conducted Power				e.i.r.p.			
						Result		Limit	Margin	Result		Limit	Margin
						[dBm]	[mW]	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[dB]
5180	-5.50	1.84	9.60	0.30	16.232	5.94	3.92	23.97	18.03	6.24	4.20	29.97	23.73
5220	-5.01	1.84	9.60	0.30	16.242	6.43	4.39	23.97	17.54	6.73	4.71	29.97	23.24
5240	-4.84	1.84	9.60	0.30	16.219	6.60	4.57	23.97	17.37	6.90	4.89	29.97	23.07
5745	-5.11	1.97	9.60	0.99	16.231	6.46	4.42	30.00	23.54	7.45	5.56	36.00	28.55
5785	-4.98	1.97	9.60	0.99	16.222	6.59	4.56	30.00	23.41	7.58	5.73	36.00	28.42
5825	-5.07	1.97	9.60	0.99	16.236	6.50	4.46	30.00	23.50	7.49	5.61	36.00	28.51

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

The test was performed with Gate function.

Chain 1

11a

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	99% OBW (B for IC) [MHz]	Conducted Power				e.i.r.p.			
						Result		Limit	Margin	Result		Limit	Margin
						[dBm]	[mW]	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[dB]
5180	-2.88	1.84	9.60	0.30	16.239	8.56	7.17	23.97	15.41	8.86	7.69	29.97	21.11
5220	-2.90	1.84	9.60	0.30	16.222	8.54	7.14	23.97	15.43	8.84	7.65	29.97	21.13
5240	-3.14	1.84	9.60	0.30	16.235	8.30	6.76	23.97	15.67	8.60	7.24	29.97	21.37
5745	-5.15	1.97	9.60	0.99	16.222	6.42	4.38	30.00	23.58	7.41	5.51	36.00	28.59
5785	-4.98	1.97	9.60	0.99	16.230	6.59	4.56	30.00	23.41	7.58	5.73	36.00	28.42
5825	-5.08	1.97	9.60	0.99	16.238	6.49	4.45	30.00	23.51	7.48	5.59	36.00	28.52

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

The test was performed with Gate function.

Maximum Conducted Output Power

Test place	Ise EMC Lab. No.3 Measurement Room
Date	June 21, 2024
Temperature / Humidity	22 deg. C / 65 % RH
Engineer	Junya Okuno
Mode	Tx 11n-20

Chain 0+1

Applied limit: 15.407, mobile and portable client device

Tested Frequency	99% OBW (B for IC)	Conducted power							e.i.r.p.						
		Chain 0+1			Result	Limit	Margin	Chain 0+1			Result	Limit	Margin		
		0	1	Sum				0	1	Sum					
[MHz]	[MHz]	[mW]	[mW]	[mW]	[dBm]	[dBm]	[dB]	[mW]	[mW]	[mW]	[dBm]	[dBm]	[dB]		
5180	17.375	3.12	5.48	8.60	9.35	23.97	14.62	3.34	5.87	9.22	9.65	29.97	20.32		
5220	17.381	3.31	5.51	8.82	9.45	23.97	14.52	3.55	5.90	9.45	9.75	29.97	20.22		
5240	17.371	3.40	5.12	8.52	9.30	23.97	14.67	3.65	5.48	9.13	9.60	29.97	20.37		
5745	17.381	3.25	3.18	6.43	8.08	30.00	21.92	4.08	3.99	8.07	9.07	36.00	26.93		
5785	17.376	3.45	3.41	6.86	8.37	30.00	21.63	4.34	4.29	8.62	9.36	36.00	26.64		
5825	17.354	3.49	3.22	6.71	8.27	30.00	21.73	4.39	4.05	8.43	9.26	36.00	26.74		

	Chain 0						Chain 1					
Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Result		Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Result	
					Cond. Power [dBm]	e.i.r.p. [dBm]					Cond. Power [dBm]	e.i.r.p. [dBm]
5180	-6.50	1.84	9.60	0.30	4.94	5.24	-4.05	1.84	9.60	0.30	7.39	7.69
5220	-6.24	1.84	9.60	0.30	5.20	5.50	-4.03	1.84	9.60	0.30	7.41	7.71
5240	-6.12	1.84	9.60	0.30	5.32	5.62	-4.35	1.84	9.60	0.30	7.09	7.39
5745	-6.45	1.97	9.60	0.99	5.12	6.11	-6.55	1.97	9.60	0.99	5.02	6.01
5785	-6.19	1.97	9.60	0.99	5.38	6.37	-6.24	1.97	9.60	0.99	5.33	6.32
5825	-6.14	1.97	9.60	0.99	5.43	6.42	-6.49	1.97	9.60	0.99	5.08	6.07

Sample Calculation:

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

$$e.i.r.p. \text{ Result} = \text{Conducted Power Result} + \text{Antenna Gain}$$

Conducted Power Limit (5250 MHz-5350 MHz, 5470 MHz-5725 MHz) = 250 mW or $(11 + 10\log B)$ dBm, whichever is lower

Conducted Power Limit (5725 MHz-5850 MHz) = 1W

The test was performed with Gate function.

Maximum Conducted Output Power

Test place	Ise EMC Lab. No.3 Measurement Room
Date	June 21, 2024
Temperature / Humidity	22 deg. C / 65 % RH
Engineer	Junya Okuno
Model	Tx 11ac-20

Chain 0+1

Applied limit: 15.407, mobile and portable client device

Tested Frequency	99% OBW (B for IC) [MHz]	Conducted power						e.i.r.p.					
		Chain 0+1			Result	Limit	Margin	Chain 0+1			Result	Limit	Margin
		0	1	Sum				0	1	Sum			
[MHz]	[MHz]	[mW]	[mW]	[mW]	[dBm]	[dBm]	[dB]	[mW]	[mW]	[mW]	[dBm]	[dBm]	[dB]
5180	17.381	3.27	5.52	8.79	9.44	23.97	14.53	3.50	5.92	9.42	9.74	29.97	20.23
5220	17.357	3.34	5.52	8.86	9.48	23.97	14.49	3.58	5.92	9.50	9.78	29.97	20.19
5240	17.381	3.42	5.21	8.63	9.36	23.97	14.61	3.66	5.58	9.25	9.66	29.97	20.31
5745	17.352	3.41	3.19	6.60	8.20	30.00	21.80	4.29	4.01	8.29	9.19	36.00	26.81
5785	17.348	3.64	3.41	7.05	8.48	30.00	21.52	4.57	4.29	8.86	9.47	36.00	26.53
5825	17.343	3.59	3.23	6.82	8.34	30.00	21.66	4.51	4.06	8.56	9.33	36.00	26.67

	Chain 0						Chain 1					
Tested Frequency [MHz]	Power Meter Reading	Cable Loss	Atten. Loss	Antenna Gain	Result		Power Meter Reading	Cable Loss	Atten. Loss	Antenna Gain	Result	
	[dBm]	[dB]	[dB]	[dBi]	Cond. Power [dBm]	e.i.r.p. [dBm]	[dBm]	[dB]	[dB]	[dBi]	Cond. Power [dBm]	e.i.r.p. [dBm]
5180	-6.30	1.84	9.60	0.30	5.14	5.44	-4.02	1.84	9.60	0.30	7.42	7.72
5220	-6.20	1.84	9.60	0.30	5.24	5.54	-4.02	1.84	9.60	0.30	7.42	7.72
5240	-6.10	1.84	9.60	0.30	5.34	5.64	-4.27	1.84	9.60	0.30	7.17	7.47
5745	-6.24	1.97	9.60	0.99	5.33	6.32	-6.53	1.97	9.60	0.99	5.04	6.03
5785	-5.96	1.97	9.60	0.99	5.61	6.60	-6.24	1.97	9.60	0.99	5.33	6.32
5825	-6.02	1.97	9.60	0.99	5.55	6.54	-6.48	1.97	9.60	0.99	5.09	6.08

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 $(11 + 10\log B)$ dBm, whichever is lower

Conducted Power Limit (5725 MHz-5850 MHz) = 1W

The test was performed with Gate function.

Maximum Conducted Output Power

Test place Ise EMC Lab. No.3 Measurement Room
Date June 21, 2024
Temperature / Humidity 22 deg. C / 65 % RH
Engineer Junya Okuno
Mode Tx 11n-40

Chain 0+1

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	99% OBW (B for IC) [MHz]	Conducted power						e.i.r.p.					
		Chain 0+1			Result [dBm]	Limit [dBm]	Margin [dB]	Chain 0+1			Result [dBm]	Limit [dBm]	Margin [dB]
		0 [mW]	1 [mW]	Sum [mW]				0 [mW]	1 [mW]	Sum [mW]			
5190	35.753	2.57	4.40	6.97	8.43	23.97	15.54	2.75	4.71	7.46	8.73	29.97	21.24
5230	35.799	2.75	4.23	6.97	8.44	23.97	15.53	2.94	4.53	7.47	8.74	29.97	21.23
5755	35.771	2.67	2.62	5.29	7.24	30.00	22.76	3.35	3.30	6.65	8.23	36.00	27.77
5795	35.719	2.88	2.58	5.45	7.37	30.00	22.63	3.61	3.24	6.85	8.36	36.00	27.64

	Chain 0						Chain 1					
Tested Frequency	Power Meter	Cable Loss	Atten. Loss	Antenna Gain	Result		Power Meter	Cable Loss	Atten. Loss	Antenna Gain	Result	
	Reading				Cond.	e.i.r.p.	Reading				Cond.	e.i.r.p.
	[dBm]	[dB]	[dB]	[dBi]	Power [dBm]	[dBm]	[dBm]	[dB]	[dB]	[dBi]	Power [dBm]	[dBm]
[MHz]	[dBm]	[dB]	[dB]	[dBi]	[dBm]	[dBm]	[dBm]	[dB]	[dB]	[dBi]	[dBm]	[dBm]
5190	-7.34	1.84	9.60	0.30	4.10	4.40	-5.01	1.84	9.60	0.30	6.43	6.73
5230	-7.05	1.84	9.60	0.30	4.39	4.69	-5.18	1.84	9.60	0.30	6.26	6.56
5755	-7.31	1.97	9.60	0.99	4.26	5.25	-7.38	1.97	9.60	0.99	4.19	5.18
5795	-6.98	1.97	9.60	0.99	4.59	5.58	-7.46	1.97	9.60	0.99	4.11	5.10

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

The test was performed with Gate function.

Maximum Conducted Output Power

Test place	Ise EMC Lab. No.3 Measurement Room
Date	June 21, 2024
Temperature / Humidity	22 deg. C / 65 % RH
Engineer	Junya Okuno
Mode	Tx 11ac-40

Chain 0+1

Applied limit: 15.407, mobile and portable client device

Chain 0+1		Conducted power							e.i.r.p.						
Tested Frequency	99% OBW (B for IC)	Chain 0+1			Result	Limit	Margin	Chain 0+1			Result	Limit	Margin		
[MHz]	[MHz]	0 [mW]	1 [mW]	Sum [mW]	[dBm]	[dBm]	[dB]	0 [mW]	1 [mW]	Sum [mW]	[dBm]	[dBm]	[dB]		
5190	35.732	2.59	4.42	7.01	8.46	23.97	15.51	2.78	4.73	7.51	8.76	29.97	21.21		
5230	35.700	2.77	4.29	7.05	8.48	23.97	15.49	2.96	4.59	7.56	8.78	29.97	21.19		
5755	35.754	2.68	2.66	5.34	7.28	30.00	22.72	3.37	3.34	6.71	8.27	36.00	27.73		
5795	35.714	2.91	2.61	5.52	7.42	30.00	22.58	3.66	3.28	6.94	8.41	36.00	27.59		

Chain 0							Chain 1					
Tested Frequency	Power Meter	Cable Loss	Atten. Loss	Antenna Gain	Result		Power Meter	Cable Loss	Atten. Loss	Antenna Gain	Result	
	Reading				Cond. Power	e.i.r.p.	Reading				Cond. Power	e.i.r.p.
	[dBm]	[dB]	[dB]	[dBi]	[dBm]	[dBm]	[dBm]	[dB]	[dB]	[dBi]	[dBm]	[dBm]
5190	-7.30	1.84	9.60	0.30	4.14	4.44	-4.99	1.84	9.60	0.30	6.45	6.75
5230	-7.03	1.85	9.60	0.30	4.42	4.72	-5.12	1.84	9.60	0.30	6.32	6.62
5755	-7.29	1.97	9.60	0.99	4.28	5.27	-7.32	1.97	9.60	0.99	4.25	5.24
5795	-6.93	1.97	9.60	0.99	4.64	5.63	-7.40	1.97	9.60	0.99	4.17	5.16

Sample Calculation:

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

$$e.i.r.p. \text{ Result} = \text{Conducted Power Result} + \text{Antenna Gain}$$

Conducted Power Limit (5250 MHz-5350 MHz, 5470 MHz-5725 MHz) = 250 mW or $(11 + 10\log B)$ dBm, whichever is lower

Conducted Power Limit (5725 MHz-5850 MHz) = 1W

The test was performed with Gate function.

Maximum Conducted Output Power

Test place	Ise EMC Lab. No.3 Measurement Room
Date	June 21, 2024
Temperature / Humidity	22 deg. C / 65 % RH
Engineer	Junya Okuno
Mode	Tx 11ac-80

Applied limit: 15.407, mobile and portable client device

Chain 0+1		Conducted power						e.i.r.p.					
Tested Frequency	99% OBW (B for IC)	Chain 0+1			Result	Limit	Margin	Chain 0+1			Result	Limit	Margin
[MHz]	[MHz]	0 [mW]	1 [mW]	Sum [mW]	[dBm]	[dBm]	[dB]	0 [mW]	1 [mW]	Sum [mW]	[dBm]	[dBm]	[dB]
5210	74.956	2.17	3.82	5.99	7.77	23.97	16.20	2.32	4.09	6.42	8.07	29.97	21.90
5775	74.811	2.23	2.12	4.35	6.39	30.00	23.61	2.80	2.67	5.47	7.38	36.00	28.62

Chain 0							Chain 1					
Tested Frequency [MHz]	Power Meter	Cable Loss	Atten. Loss	Antenna Gain	Result		Power Meter	Cable Loss	Atten. Loss	Antenna Gain	Result	
	Reading				Cond. Power	e.i.r.p.	Reading				Cond. Power	e.i.r.p.
	[dBm]	[dB]	[dB]	[dBi]	[dBm]	[dBm]	[dBm]	[dB]	[dB]	[dBi]	[dBm]	[dBm]
5210	-8.08	1.84	9.60	0.30	3.36	3.66	-5.62	1.84	9.60	0.30	5.82	6.12
5775	-8.09	1.97	9.60	0.99	3.48	4.47	-8.30	1.97	9.60	0.99	3.27	4.26

Sample Calculation:

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

$$\text{e.i.r.p. Result} = \text{Conducted Power Result} + \text{Antenna Gain}$$

Conducted Power Limit (5250 MHz-5350 MHz, 5470 MHz-5725 MHz) = 250 mW or $(11 + 10\log B)$ dBm, whichever is lower

Conducted Power Limit (5725 MHz-5850 MHz) = 1W

The test was performed with Gate function.

Maximum Conducted Output Power (Rate Check)

Test place	Ise EMC Lab.	No.3 Measurement Room
Date	No.4 Measurement Room	June 19, 2024
Temperature / Humidity	June 18, 2024	22 deg. C / 50 % RH
Engineer	20 deg. C / 52 % RH	Junya Okuno
Mode	Junya Okuno	
	Tx 11a	

5180 MHz

Mode	Antenna	Rate [Mbps]	Result (Burst Average)		Remarks
			[dBm]	[mW]	
11a	Chain 0	6	5.81	3.81	
		9	5.86	3.85	
		12	5.76	3.76	
		18	5.94	3.92	
		24	5.35	3.43	
		36	5.36	3.43	
		48	5.35	3.43	
		54	5.36	3.43	
	Chain 1	6	8.47	7.03	
		9	8.39	6.90	
		12	8.42	6.95	
		18	8.56	7.17	*
		24	8.16	6.54	
		36	8.09	6.44	
		48	8.09	6.44	
		54	8.06	6.39	

* Worst rate

This test was conducted by the use of Gate function.

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

Maximum Conducted Output Power (Rate Check)

Test place	Ise EMC Lab. No.3 Measurement Room
Date	June 19, 2024
Temperature / Humidity	22 deg. C / 50 % RH
Engineer	Junya Okuno
Mode	Tx 11n-20

5180 MHz

Mode	SISO or MIMO	MCS Number	Result (Burst Average)						Remarks
			Chain		Chain		Chain		
			0 [dBm]	0 [mW]	1 [dBm]	1 [mW]	0+1 [dBm]	0+1 [mW]	
11n-20	SISO	0	4.67	2.93	7.10	5.13	-	-	
		1	4.47	2.80	7.03	5.04	-	-	
		2	4.73	2.97	7.24	5.29	-	-	
		3	4.49	2.81	7.02	5.03	-	-	
		4	4.44	2.78	6.95	4.95	-	-	
		5	4.47	2.80	6.95	4.95	-	-	
		6	4.49	2.81	7.01	5.02	-	-	
	MIMO	7	4.44	2.78	7.00	5.01	-	-	
		8	4.85	3.05	7.15	5.18	9.16	8.24	
		9	4.88	3.07	7.20	5.24	9.20	8.32	
		10	4.90	3.09	7.24	5.29	9.23	8.38	*
		11	4.73	2.97	7.09	5.11	9.08	8.08	
		12	4.62	2.90	6.97	4.97	8.96	7.87	
		13	4.52	2.83	7.18	5.22	9.06	8.05	
		14	4.62	2.90	7.01	5.02	8.98	7.92	
15	4.68	2.94	7.12	5.15	9.08	8.08			

* Worst rate

This test was conducted by the use of Gate function.

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

Maximum Conducted Output Power (Rate Check)

Test place	Ise EMC Lab. No.3 Measurement Room
Date	June 19, 2024
Temperature / Humidity	22 deg. C / 50 % RH
Engineer	Junya Okuno
Mode	Tx 11ac-20

5180 MHz

Mode	SISO or MIMO	MCS Number	Result (Burst Average)						Remarks
			Chain		Chain		Chain		
			0 [dBm]	0 [mW]	1 [dBm]	1 [mW]	0+1 [dBm]	0+1 [mW]	
11ac-20	SISO	0	5.72	3.73	8.27	6.71	-	-	
		1	5.56	3.60	8.17	6.56	-	-	
		2	5.73	3.74	8.30	6.76	-	-	
		3	5.62	3.65	8.17	6.56	-	-	
		4	5.46	3.51	8.14	6.51	-	-	
		5	5.53	3.57	8.03	6.35	-	-	
		6	5.50	3.55	8.09	6.44	-	-	
		7	5.52	3.56	8.11	6.47	-	-	
	8	4.50	2.82	7.09	5.11	-	-		
	MIMO	0	4.92	3.10	7.23	5.28	9.23	8.38	
		1	4.92	3.10	7.22	5.27	9.23	8.37	
		2	4.97	3.14	7.38	5.47	9.35	8.60	*
		3	4.77	3.00	7.29	5.35	9.22	8.35	
		4	4.71	2.96	7.11	5.14	9.08	8.09	
		5	4.75	2.98	7.19	5.23	9.15	8.22	
		6	4.69	2.94	7.08	5.10	9.05	8.04	
		7	4.74	2.98	7.21	5.26	9.16	8.23	
	8	3.76	2.38	6.20	4.17	8.16	6.54		

* Worst rate

This test was conducted by the use of Gate function.

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

Maximum Conducted Output Power (Rate Check)

Test place	Ise EMC Lab. No.3 Measurement Room
Date	June 20, 2024
Temperature / Humidity	23 deg. C / 60 % RH
Engineer	Junya Okuno
Mode	Tx 11n-40

5190 MHz

Mode	SISO or MIMO	MCS Number	Result (Burst Average)						Remarks
			Chain		Chain		Chain		
			0 [dBm]	0 [mW]	1 [dBm]	1 [mW]	0+1 [dBm]	0+1 [mW]	
11n-40	SISO	0	3.84	2.42	6.42	4.38	-	-	
		1	3.81	2.40	6.41	4.37	-	-	
		2	3.77	2.38	6.39	4.35	-	-	
		3	3.64	2.31	6.33	4.29	-	-	
		4	3.71	2.35	6.33	4.29	-	-	
		5	3.61	2.29	6.35	4.31	-	-	
		6	3.59	2.28	6.36	4.32	-	-	
		7	3.58	2.28	6.34	4.30	-	-	
	MIMO	8	4.10	2.57	6.43	4.39	8.43	6.96	*
		9	3.99	2.50	6.42	4.38	8.38	6.89	
		10	3.95	2.48	6.42	4.38	8.37	6.86	
		11	3.84	2.42	6.40	4.36	8.31	6.78	
		12	3.82	2.41	6.39	4.35	8.30	6.76	
		13	3.81	2.40	6.39	4.35	8.30	6.75	
		14	3.76	2.38	6.37	4.33	8.27	6.71	
15		3.72	2.35	6.37	4.33	8.25	6.69		

* Worst rate

This test was conducted by the use of Gate function.

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

Maximum Conducted Output Power (Rate Check)

Test place
Date
Temperature / Humidity
Engineer
Mode

Ise EMC Lab. No.3 Measurement Room
June 20, 2024
23 deg. C / 60 % RH
Junya Okuno
Tx 11ac-40

5190 MHz

Mode	SISO or MIMO	MCS Number	Result (Burst Average)						Remarks
			Chain		Chain		Chain		
			0 [dBm]	0 [mW]	1 [dBm]	1 [mW]	0+1 [dBm]	0+1 [mW]	
11ac-40	SISO	0	3.86	2.43	6.43	4.39	-	-	
		1	3.79	2.39	6.36	4.32	-	-	
		2	3.80	2.40	6.35	4.31	-	-	
		3	3.62	2.30	6.24	4.20	-	-	
		4	3.58	2.28	6.27	4.23	-	-	
		5	2.61	1.82	6.24	4.20	-	-	
		6	3.62	2.30	6.18	4.15	-	-	
		7	3.54	2.26	6.22	4.19	-	-	
		8	1.65	1.46	4.55	2.85	-	-	
	9	1.67	1.47	4.48	2.80	-	-		
	MIMO	0	4.13	2.59	6.44	4.40	8.44	6.99	*
		1	4.03	2.53	6.42	4.38	8.39	6.91	
		2	3.96	2.49	6.37	4.33	8.34	6.82	
		3	3.78	2.39	6.27	4.23	8.21	6.62	
		4	3.86	2.43	6.31	4.27	8.26	6.70	
		5	3.82	2.41	6.36	4.32	8.28	6.73	
		6	3.77	2.38	6.30	4.26	8.22	6.64	
		7	3.77	2.38	6.37	4.33	8.27	6.71	
8		1.84	1.53	4.63	2.90	6.46	4.43		
9	1.80	1.51	4.63	2.90	6.45	4.41			

* Worst rate

This test was conducted by the use of Gate function.

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

Maximum Conducted Output Power

Test place
Date
Temperature / Humidity
Engineer
Mode

Ise EMC Lab. No.3 Measurement Room
June 20, 2024
23 deg. C / 60 % RH
Junya Okuno
Tx 11ac-80

5210 MHz

Mode	SISO or MIMO	MCS Number	Chain		Result (Burst Average)		Chain		Remarks
			0 [dBm]	0 [mW]	1 [dBm]	1 [mW]	0+1 [dBm]	0+1 [mW]	
11ac-80	SISO	0	3.12	2.05	5.59	3.62	-	-	
		1	3.13	2.05	5.61	3.64	-	-	
		2	3.16	2.07	5.71	3.72	-	-	
		3	2.95	1.97	5.45	3.51	-	-	
		4	2.98	1.98	5.42	3.48	-	-	
		5	2.95	1.97	5.43	3.49	-	-	
		6	2.90	1.95	5.45	3.51	-	-	
		7	2.88	1.94	5.49	3.54	-	-	
		8	0.89	1.23	3.55	2.26	-	-	
		9	0.86	1.22	3.47	2.22	-	-	
	MIMO	0	3.24	2.11	5.60	3.63	7.59	5.74	
		1	3.27	2.12	5.63	3.65	7.62	5.78	
		2	3.35	2.16	5.82	3.82	7.77	5.98	*
		3	3.06	2.02	5.47	3.52	7.44	5.54	
		4	3.09	2.04	5.55	3.59	7.50	5.62	
		5	3.05	2.02	5.59	3.62	7.51	5.64	
		6	2.98	1.98	5.63	3.65	7.51	5.64	
		7	2.99	1.99	5.64	3.66	7.52	5.65	
		8	1.04	1.27	3.69	2.34	5.57	3.61	
		9	0.97	1.25	3.62	2.30	5.50	3.55	

* Worst rate

This test was conducted by the use of Gate function.

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

Burst rate confirmation

Test place

Date

Temperature / Humidity

Engineer

Mode

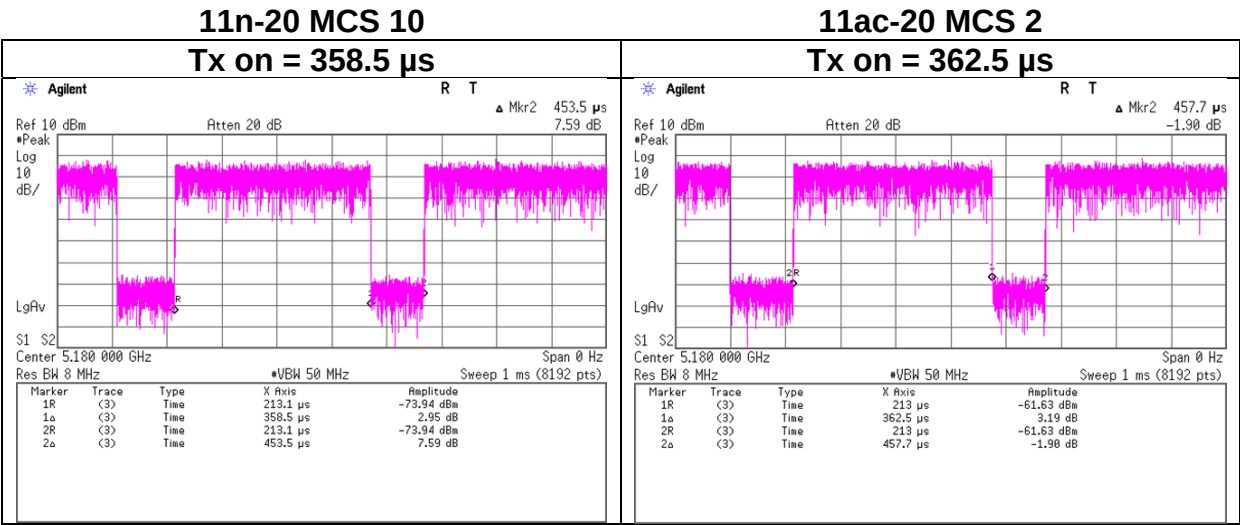
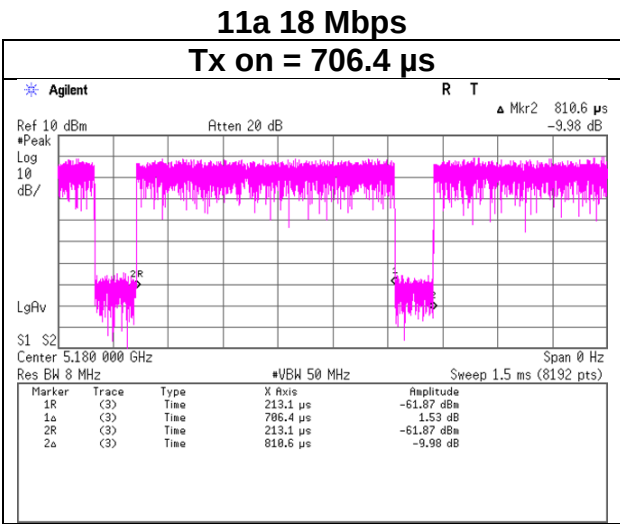
Ise EMC Lab. No.6 Measurement Room

June 24, 2024

23 deg. C / 55 % RH

Yuta Moriya

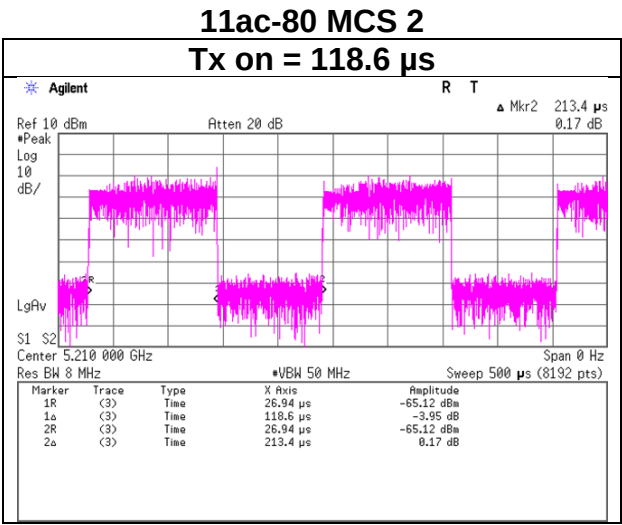
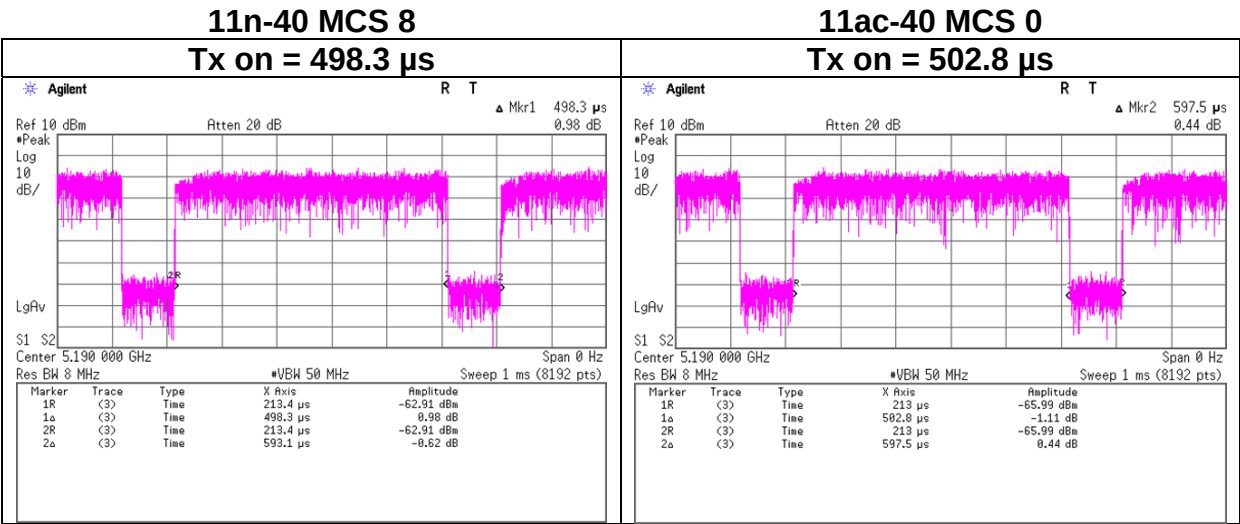
Tx



Burst rate confirmation

Test place
Date
Temperature / Humidity
Engineer
Mode

Ise EMC Lab. No.6 Measurement Room
June 24, 2024
23 deg. C / 55 % RH
Yuta Moriya
Tx



Maximum Power Spectral Density

Test place
Date
Temperature / Humidity
Engineer
Mode

Ise EMC Lab. No.5 Measurement Room
June 27, 2024
23 deg. C / 50 % RH
Shousei Hamaguchi
Tx 11a

Chain 0

Applied limit: 15.407, mobile and portable client device

PSD (e.i.r.p.) Table and Error Check Table											
Tested Frequency	PSD Reading	Cable Loss	Atten. Loss	Antenna Gain	RBW Correction Factor	PSD (Conducted)			PSD (e.i.r.p.)		
[MHz]	[dBm/MHz]	[dB]	[dB]	[dBi]	[dB]	Result	Limit	Margin	Result	Limit	Margin
5180	-17.83	3.34	9.60	0.30	0.00	-4.89	11.00	15.89	-4.59	17.00	21.59
5220	-17.47	3.34	9.60	0.30	0.00	-4.53	11.00	15.53	-4.23	17.00	21.23
5240	-17.48	3.34	9.60	0.30	0.00	-4.54	11.00	15.54	-4.24	17.00	21.24
5745	-21.29	3.57	9.60	0.99	0.27	-7.85	30.00	37.85	-6.86	36.00	42.86
5785	-21.19	3.58	9.60	0.99	0.27	-7.74	30.00	37.74	-6.75	36.00	42.75
5825	-21.27	3.59	9.60	0.99	0.27	-7.81	30.00	37.81	-6.82	36.00	42.82

Sample Calculation:

PSD: Power Spectral Density

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

$$\text{RBW Correction Factor} = 10 * \log (\text{Specified bandwidth} / \text{Measured bandwidth})$$
$$\text{PSD Result (Conducted)} = \text{Reading} + \text{Cable Loss (including the cable(s) customer supplied)} + \text{Atten. Loss} + \text{RBW Correction Factor}$$
$$\text{PSD Result (e.i.r.p.)} = \text{Conducted PSD Result} + \text{Antenna Gain}$$

Chain 1

Applied limit: 15.407, mobile and portable client device

Tested Frequency	PSD Reading	Cable Loss	Atten. Loss	Antenna Gain	RBW Correction Factor	PSD (Conducted)			PSD (e.i.r.p.)		
						Result	Limit	Margin	Result	Limit	Margin
						[dBm/MHz]	[dBm/MHz]	[dB]	[dBm/MHz]	[dBm/MHz]	[dB]
5180	-15.34	3.34	9.60	0.30	0.00	-2.40	11.00	13.40	-2.10	17.00	19.10
5220	-15.44	3.34	9.60	0.30	0.00	-2.50	11.00	13.50	-2.20	17.00	19.20
5240	-15.77	3.34	9.60	0.30	0.00	-2.83	11.00	13.83	-2.53	17.00	19.53
5745	-20.30	3.57	9.60	0.99	0.27	-6.86	30.00	36.86	-5.87	36.00	41.87
5785	-20.34	3.58	9.60	0.99	0.27	-6.89	30.00	36.89	-5.90	36.00	41.90
5825	-20.87	3.59	9.60	0.99	0.27	-7.41	30.00	37.41	-6.42	36.00	42.42

Sample Calculation:

PSD: Power Spectral Density

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

$$\text{RBW Correction Factor} = 10 * \log (\text{Specified bandwidth} / \text{Measured bandwidth})$$
$$\text{PSD Result (Conducted)} = \text{Reading} + \text{Cable Loss (including the cable(s) customer supplied)} + \text{Atten. Loss} + \text{RBW Correction Factor}$$
$$\text{PSD Result (e.i.r.p.)} = \text{Conducted PSD Result} + \text{Antenna Gain}$$

Maximum Power Spectral Density

Test place
Date
Temperature / Humidity
Engineer
Mode

Ise EMC Lab. No.5 Measurement Room
June 27, 2024
23 deg. C / 50 % RH
Shousei Hamaguchi
Tx 11n-20

Chain 0+1

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	PSD (Conducted)						PSD (e.i.r.p.)					
	Chain			Result	Limit	Margin	Chain			Result	Limit	Margin
	0	1	Sum				0	1	Sum			
[mW/MHz]	[mW/MHz]	[mW/MHz]	[mW/MHz]	[dBm/MHz]	[dBm/MHz]	[dB]	[mW/MHz]	[mW/MHz]	[mW/MHz]	[dBm/MHz]	[dBm/MHz]	[dB]
5180	0.25	0.44	0.69	-1.62	11.00	12.62	0.27	0.47	0.74	-1.32	17.00	18.32
5220	0.26	0.44	0.70	-1.53	11.00	12.53	0.28	0.47	0.75	-1.23	17.00	18.23
5240	0.28	0.41	0.69	-1.63	11.00	12.63	0.30	0.44	0.74	-1.33	17.00	18.33
5745	0.14	0.14	0.28	-5.45	30.00	35.45	0.18	0.18	0.36	-4.46	36.00	40.46
5785	0.13	0.14	0.27	-5.63	30.00	35.63	0.17	0.18	0.34	-4.64	36.00	40.64
5825	0.13	0.13	0.26	-5.90	30.00	35.90	0.16	0.16	0.32	-4.91	36.00	40.91

Chain 0								Chain 1							
Tested Frequency [MHz]	RBW Correction Factor [dB]	PSD Reading [dBm/MHz]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	PSD Result		PSD Reading [dBm/MHz]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	PSD Result			
						Cond.	e.i.r.p.					Cond.	e.i.r.p.		
						[dBm/MHz]	[dBm/MHz]					[dBm/MHz]	[dBm/MHz]		
5180	0.00	-18.92	3.34	9.60	0.30	-5.98	-5.68	-16.53	3.34	9.60	0.30	-3.59	-3.29		
5220	0.00	-18.73	3.34	9.60	0.30	-5.79	-5.49	-16.51	3.34	9.60	0.30	-3.57	-3.27		
5240	0.00	-18.45	3.34	9.60	0.30	-5.51	-5.21	-16.85	3.34	9.60	0.30	-3.91	-3.61		
5745	0.27	-21.90	3.57	9.60	0.99	-8.46	-7.47	-21.90	3.57	9.60	0.99	-8.46	-7.47		
5785	0.27	-22.24	3.58	9.60	0.99	-8.79	-7.80	-21.94	3.58	9.60	0.99	-8.49	-7.50		
5825	0.27	-22.39	3.59	9.60	0.99	-8.93	-7.94	-22.34	3.59	9.60	0.99	-8.88	-7.89		

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

Maximum Power Spectral Density

Test place
Date
Temperature / Humidity
Engineer
Mode

Ise EMC Lab. No.5 Measurement Room
June 27, 2024
23 deg. C / 50 % RH
Shousei Hamaguchi
Tx 11ac-20

Chain 0+1

Applied limit: 15.407, mobile and portable client device

PSD (Conducted)							PSD (e.i.r.p.)					
Tested Frequency	0	Chain 1	Sum	Result	Limit	Margin	0	Chain 1	Sum	Result	Limit	Margin
[MHz]	[mW/MHz]	[mW/MHz]	[mW/MHz]	[dBm/MHz]	[dBm/MHz]	[dB]	[mW/MHz]	[mW/MHz]	[mW/MHz]	[dBm/MHz]	[dBm/MHz]	[dB]
5180	0.26	0.44	0.71	-1.51	11.00	12.51	0.28	0.48	0.76	-1.21	17.00	18.21
5220	0.27	0.45	0.72	-1.44	11.00	12.44	0.29	0.48	0.77	-1.14	17.00	18.14
5240	0.29	0.41	0.70	-1.56	11.00	12.56	0.31	0.44	0.75	-1.26	17.00	18.26
5745	0.14	0.15	0.29	-5.35	30.00	35.35	0.18	0.19	0.37	-4.36	36.00	40.36
5785	0.14	0.14	0.29	-5.41	30.00	35.41	0.18	0.18	0.36	-4.42	36.00	40.42
5825	0.13	0.13	0.26	-5.85	30.00	35.85	0.16	0.17	0.33	-4.86	36.00	40.86

		Chain 0						Chain 1					
Tested Frequency	RBW Correction Factor	PSD Reading	Cable Loss	Atten. Loss	Antenna Gain	PSD Result		PSD Reading	Cable Loss	Atten. Loss	Antenna Gain	PSD Result	
						Cond.	e.i.r.p.					Cond.	e.i.r.p.
[MHz]	[dB]	[dBm/MHz]	[dB]	[dB]	[dBi]	[dBm/MHz]	[dBm/MHz]	[dBm/MHz]	[dB]	[dB]	[dBi]	[dBm/MHz]	[dBm/MHz]
5180	0.00	-18.75	3.34	9.60	0.30	-5.81	-5.51	-16.46	3.34	9.60	0.30	-3.52	-3.22
5220	0.00	-18.59	3.34	9.60	0.30	-5.65	-5.35	-16.45	3.34	9.60	0.30	-3.51	-3.21
5240	0.00	-18.36	3.34	9.60	0.30	-5.42	-5.12	-16.79	3.34	9.60	0.30	-3.85	-3.55
5745	0.27	-21.86	3.57	9.60	0.99	-8.42	-7.43	-21.74	3.57	9.60	0.99	-8.30	-7.31
5785	0.27	-21.90	3.58	9.60	0.99	-8.45	-7.46	-21.84	3.58	9.60	0.99	-8.39	-7.40
5825	0.27	-22.37	3.59	9.60	0.99	-8.91	-7.92	-22.26	3.59	9.60	0.99	-8.80	-7.81

Sample Calculation:

PSD: Power Spectral Density

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

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

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

$$\text{PSD Result (e.i.r.p.)} = \text{Conducted PSD Result} + \text{Antenna Gain}$$

Maximum Power Spectral Density

Test place
Date
Temperature / Humidity
Engineer
Mode

Ise EMC Lab. No.5 Measurement Room
June 27, 2024
23 deg. C / 50 % RH
Shousei Hamaguchi
Tx 11n-40

Chain 0+1							Applied limit: 15.407, mobile and portable client device					
Tested Frequency	PSD (Conducted)						PSD (e.i.r.p.)					
	Chain			Result	Limit	Margin	Chain			Result	Limit	Margin
	0	1	Sum				0	1	Sum			
	[MHz]	[mW/MHz]	[mW/MHz]	[mW/MHz]	[dBm/MHz]	[dBm/MHz]	[dB]	[mW/MHz]	[mW/MHz]	[mW/MHz]	[dBm/MHz]	[dBm/MHz]
5190	0.10	0.17	0.26	-5.78	11.00	16.78	0.11	0.18	0.28	-5.48	17.00	22.48
5230	0.11	0.16	0.27	-5.71	11.00	16.71	0.11	0.17	0.29	-5.41	17.00	22.41
5755	0.05	0.05	0.10	-10.05	30.00	40.05	0.06	0.07	0.12	-9.06	36.00	45.06
5795	0.05	0.05	0.10	-9.85	30.00	39.85	0.06	0.07	0.13	-8.86	36.00	44.86

		Chain 0						Chain 1					
Tested Frequency	RBW Correction Factor	PSD Reading	Cable Loss	Atten. Loss	Antenna Gain	PSD Result Cond.	e.i.r.p.	PSD Reading	Cable Loss	Atten. Loss	Antenna Gain	PSD Result Cond.	e.i.r.p.
[MHz]	[dB]	[dBm/MHz]	[dB]	[dB]	[dBi]	[dBm/MHz]	[dBm/MHz]	[dBm/MHz]	[dB]	[dB]	[dBi]	[dBm/MHz]	[dBm/MHz]
5190	0.00	-23.00	3.34	9.60	0.30	-10.06	-9.76	-20.75	3.34	9.60	0.30	-7.81	-7.51
5230	0.00	-22.64	3.34	9.60	0.30	-9.70	-9.40	-20.85	3.34	9.60	0.30	-7.91	-7.61
5755	0.27	-26.79	3.57	9.60	0.99	-13.35	-12.36	-26.23	3.57	9.60	0.99	-12.79	-11.80
5795	0.27	-26.41	3.58	9.60	0.99	-12.96	-11.97	-26.21	3.58	9.60	0.99	-12.76	-11.77

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

Maximum Power Spectral Density

Test place Ise EMC Lab. No.5 Measurement Room
Date June 27, 2024
Temperature / Humidity 23 deg. C / 50 % RH
Engineer Shousei Hamaguchi
Mode Tx 11ac-40

Chain 0+1

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	PSD (Conducted)						PSD (e.i.r.p.)					
	Chain			Result	Limit	Margin	Chain			Result	Limit	Margin
	0	1	Sum				0	1	Sum			
	[mW/MHz]	[mW/MHz]	[mW/MHz]	[dBm/MHz]	[dBm/MHz]	[dB]	[mW/MHz]	[mW/MHz]	[mW/MHz]	[dBm/MHz]	[dBm/MHz]	[dB]
5190	0.10	0.17	0.27	-5.75	11.00	16.75	0.11	0.18	0.29	-5.45	17.00	22.45
5230	0.11	0.16	0.27	-5.65	11.00	16.65	0.12	0.18	0.29	-5.35	17.00	22.35
5755	0.05	0.05	0.10	-9.81	30.00	39.81	0.06	0.07	0.13	-8.82	36.00	44.82
5795	0.06	0.05	0.11	-9.63	30.00	39.63	0.07	0.07	0.14	-8.64	36.00	44.64

Chain 0								Chain 1					
Tested Frequency [MHz]	RBW Correction Factor [dB]	PSD Reading	Cable Loss	Atten. Loss	Antenna Gain	PSD Result		PSD Reading [dBm/MHz]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	PSD Result	
		[dBm/MHz]	[dB]	[dB]	[dB]	Cond.	e.i.r.p.					Cond.	e.i.r.p.
						[dBm/MHz]	[dBm/MHz]					[dBm/MHz]	[dBm/MHz]
5190	0.00	-22.98	3.34	9.60	0.30	-10.04	-9.74	-20.71	3.34	9.60	0.30	-7.77	-7.47
5230	0.00	-22.57	3.34	9.60	0.30	-9.63	-9.33	-20.80	3.34	9.60	0.30	-7.86	-7.56
5755	0.27	-26.43	3.57	9.60	0.99	-12.99	-12.00	-26.08	3.57	9.60	0.99	-12.64	-11.65
5795	0.27	-26.02	3.58	9.60	0.99	-12.57	-11.58	-26.15	3.58	9.60	0.99	-12.70	-11.71

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

Maximum Power Spectral Density

Test place	Ise EMC Lab. No.5 Measurement Room
Date	June 27, 2024
Temperature / Humidity	23 deg. C / 50 % RH
Engineer	Shousei Hamaguchi
Mode	Tx 11ac-80

Chain 0+1

Applied limit: 15.407, mobile and portable client device

PSD (Conducted)							PSD (e.i.r.p.)						
Tested Frequency	0	Chain 1	Sum	Result	Limit	Margin	0	Chain 1	Sum	Result	Limit	Margin	
[MHz]	[mW/MHz]	[mW/MHz]	[mW/MHz]	[dBm/MHz]	[dBm/MHz]	[dB]	[mW/MHz]	[mW/MHz]	[mW/MHz]	[dBm/MHz]	[dBm/MHz]	[dB]	
5210	0.04	0.08	0.12	-9.28	11.00	20.28	0.04	0.08	0.13	-8.98	17.00	25.98	
5775	0.02	0.03	0.05	-13.40	30.00	43.40	0.03	0.03	0.06	-12.41	36.00	48.41	

		Chain 0						Chain 1					
Tested Frequency	RBW Correction Factor	PSD Reading	Cable Loss	Atten. Loss	Antenna Gain	PSD Result		PSD Reading	Cable Loss	Atten. Loss	Antenna Gain	PSD Result	
						Cond.	e.i.r.p.					Cond.	e.i.r.p.
[MHz]	[dB]	[dBm/MHz]	[dB]	[dB]	[dBi]	[dBm/MHz]	[dBm/MHz]	[dBm/MHz]	[dB]	[dB]	[dBi]	[dBm/MHz]	[dBm/MHz]
5210	0.00	-26.74	3.34	9.60	0.30	-13.80	-13.50	-24.11	3.34	9.60	0.30	-11.17	-10.87
5775	0.27	-30.43	3.57	9.60	0.99	-16.99	-16.00	-29.33	3.57	9.60	0.99	-15.89	-14.90

Sample Calculation:

PSD: Power Spectral Density

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

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

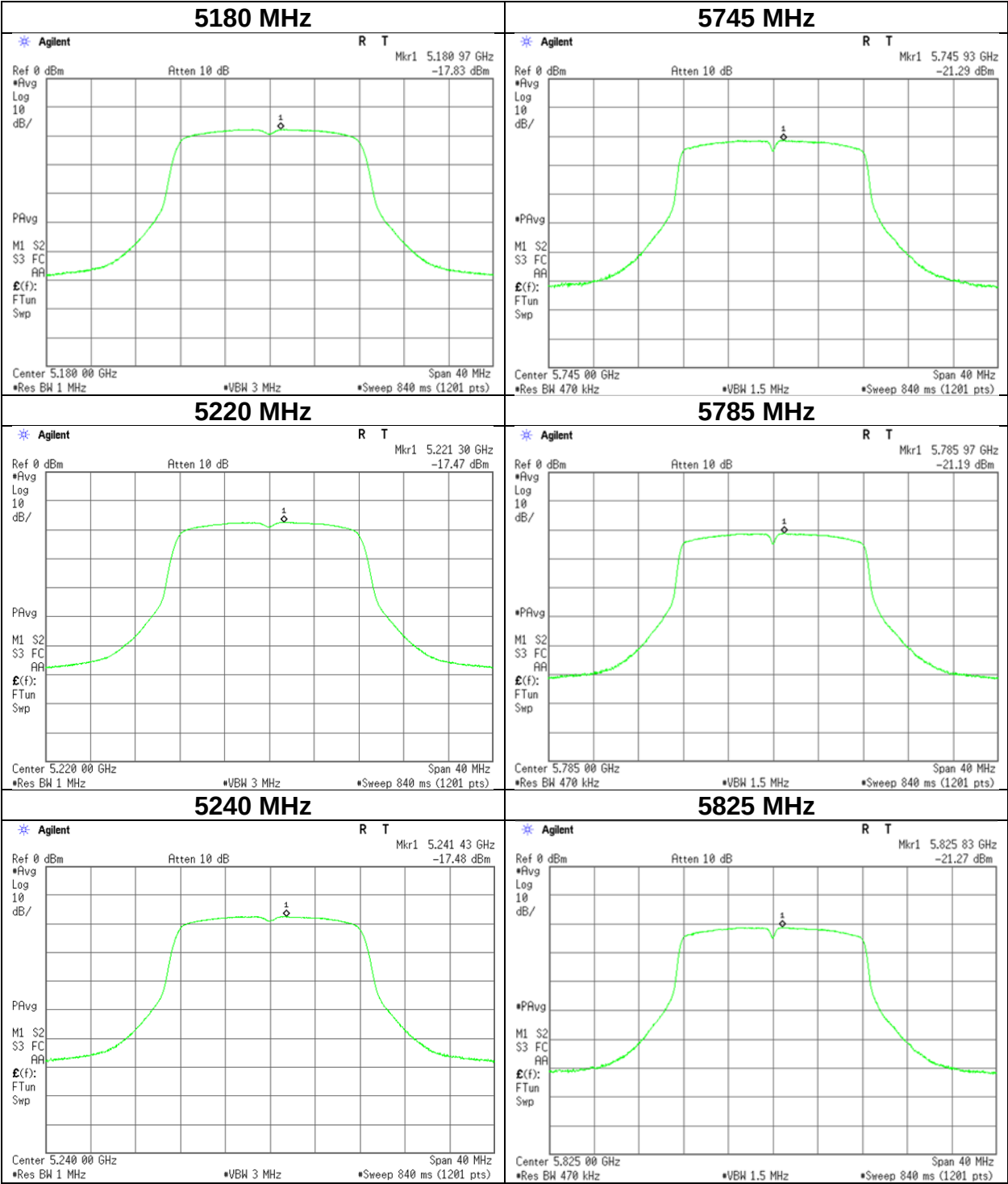
PSD Result (Conducted) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + RBW Correction Factor

$$\text{PSD Result (e.i.r.p.)} = \text{Conducted PSD Result} + \text{Antenna Gain}$$

Maximum Power Spectral Density

Test place	Ise EMC Lab. No. 5 Measurement Room
Date	June 27, 2024
Temperature / Humidity	23 deg. C / 50 % RH
Engineer	Shousei Hamaguchi
Mode	Tx 11a

11a, Chain 0



Maximum Power Spectral Density

Test place

Date

Temperature / Humidity

Engineer

Mode

Ise EMC Lab. No. 5 Measurement Room

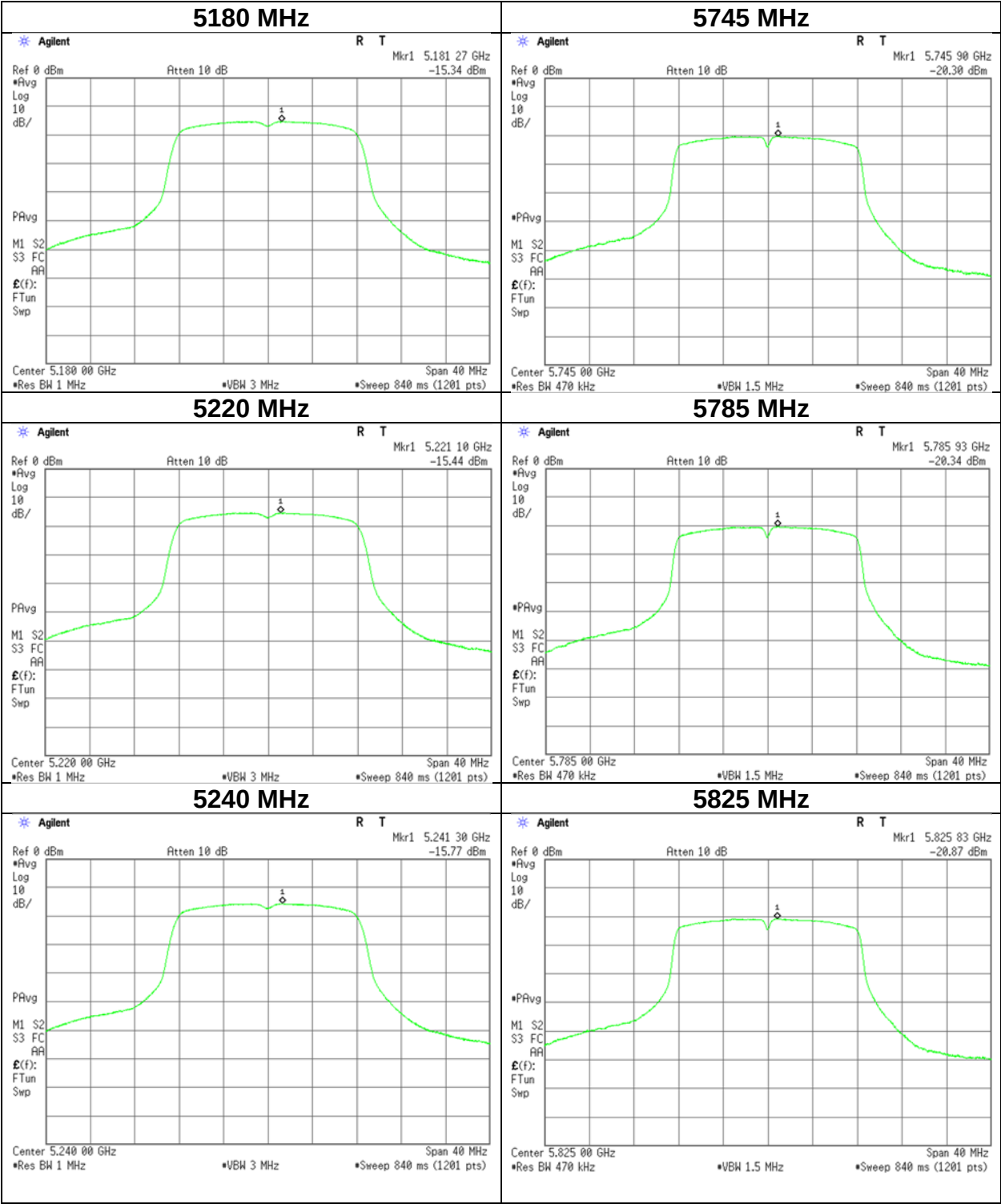
June 27, 2024

23 deg. C / 50 % RH

Shousei Hamaguchi

Tx 11a

11a, Chain 1



Maximum Power Spectral Density

Test place

Date

Temperature / Humidity

Engineer

Mode

Ise EMC Lab. No. 5 Measurement Room

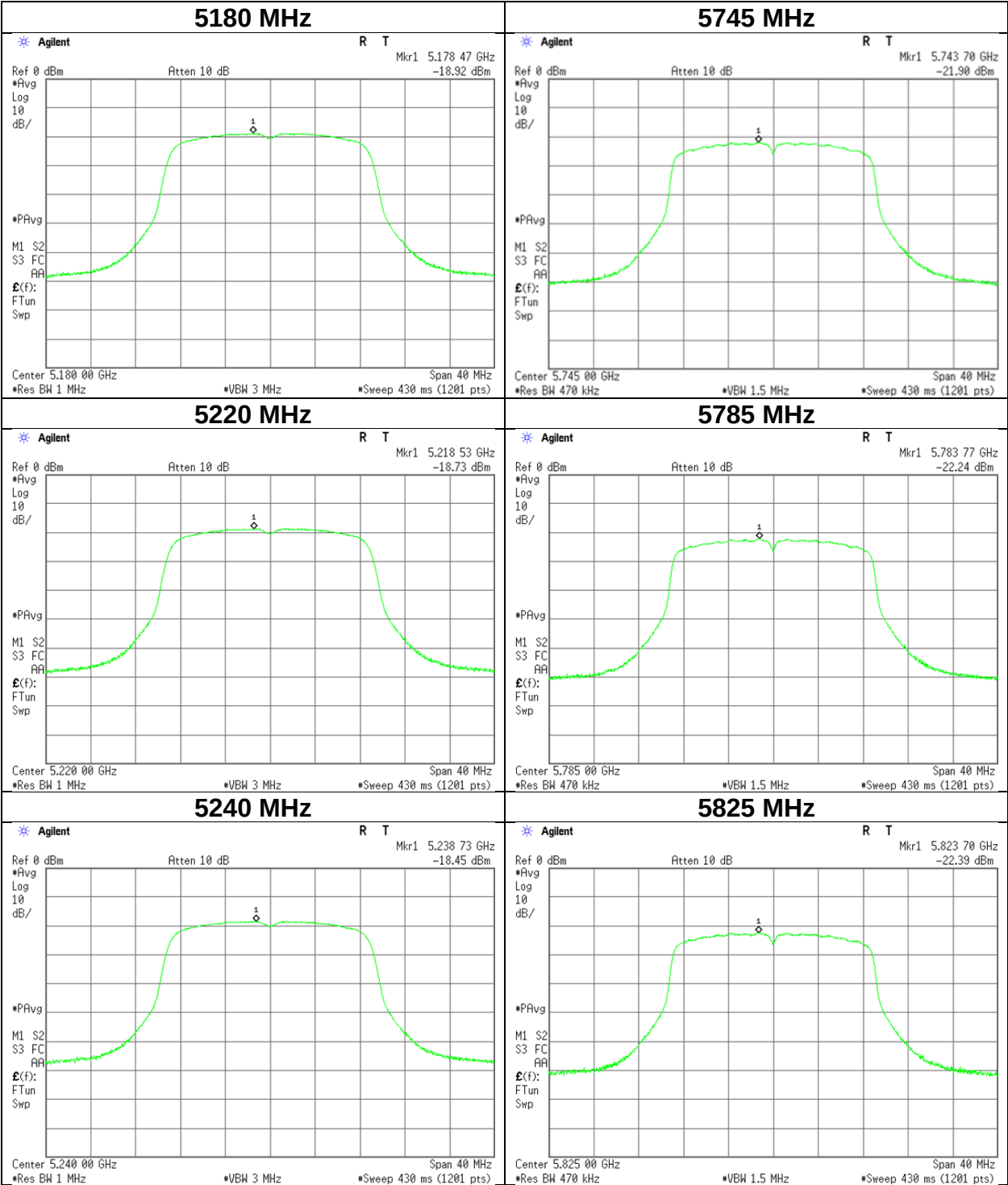
June 27, 2024

23 deg. C / 50 % RH

Shousei Hamaguchi

Tx 11n-20

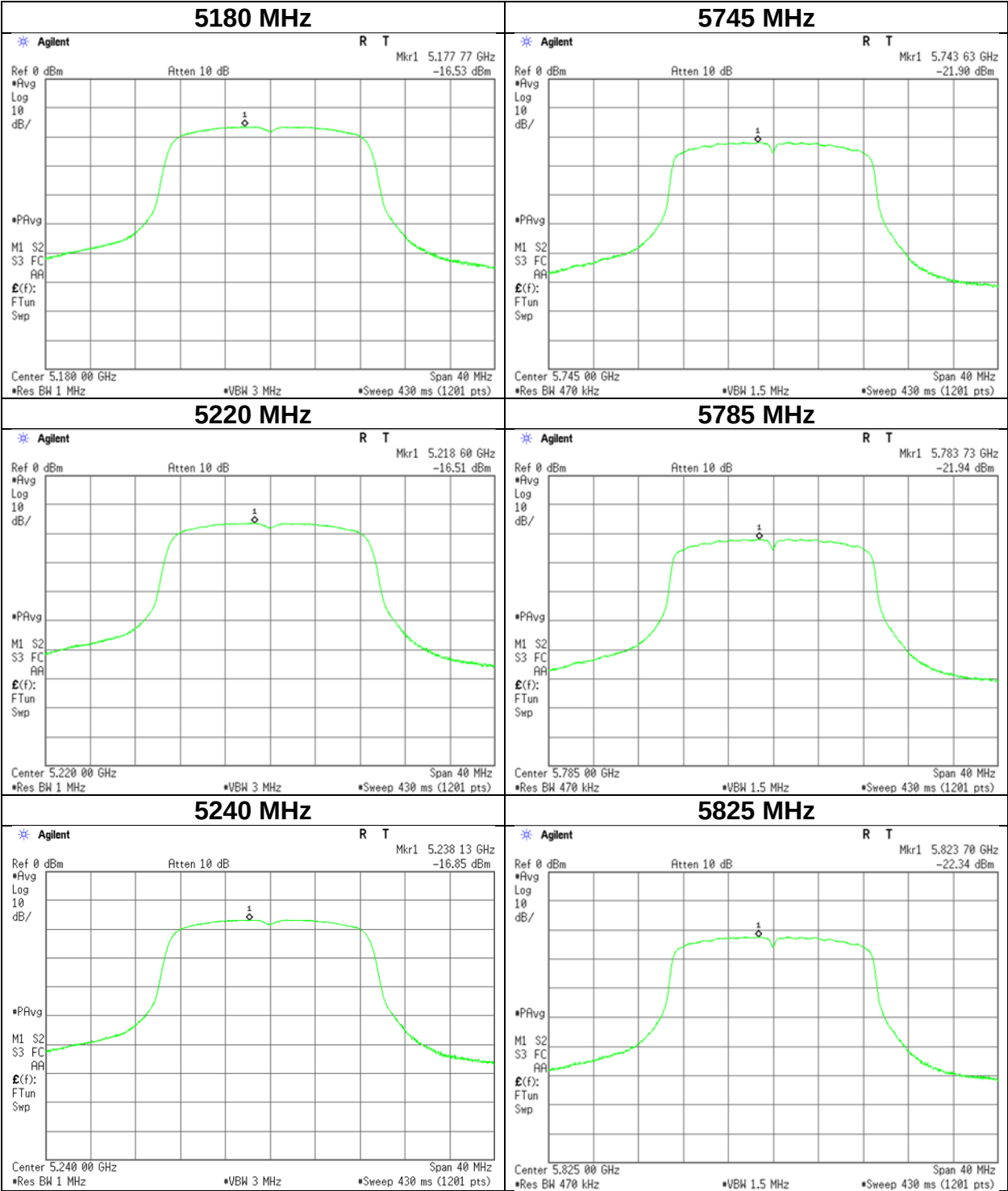
11n-20, Chain 0



Maximum Power Spectral Density

Test place	Ise EMC Lab. No. 5 Measurement Room
Date	June 27, 2024
Temperature / Humidity	23 deg. C / 50 % RH
Engineer	Shousei Hamaguchi
Mode	Tx 11n-20

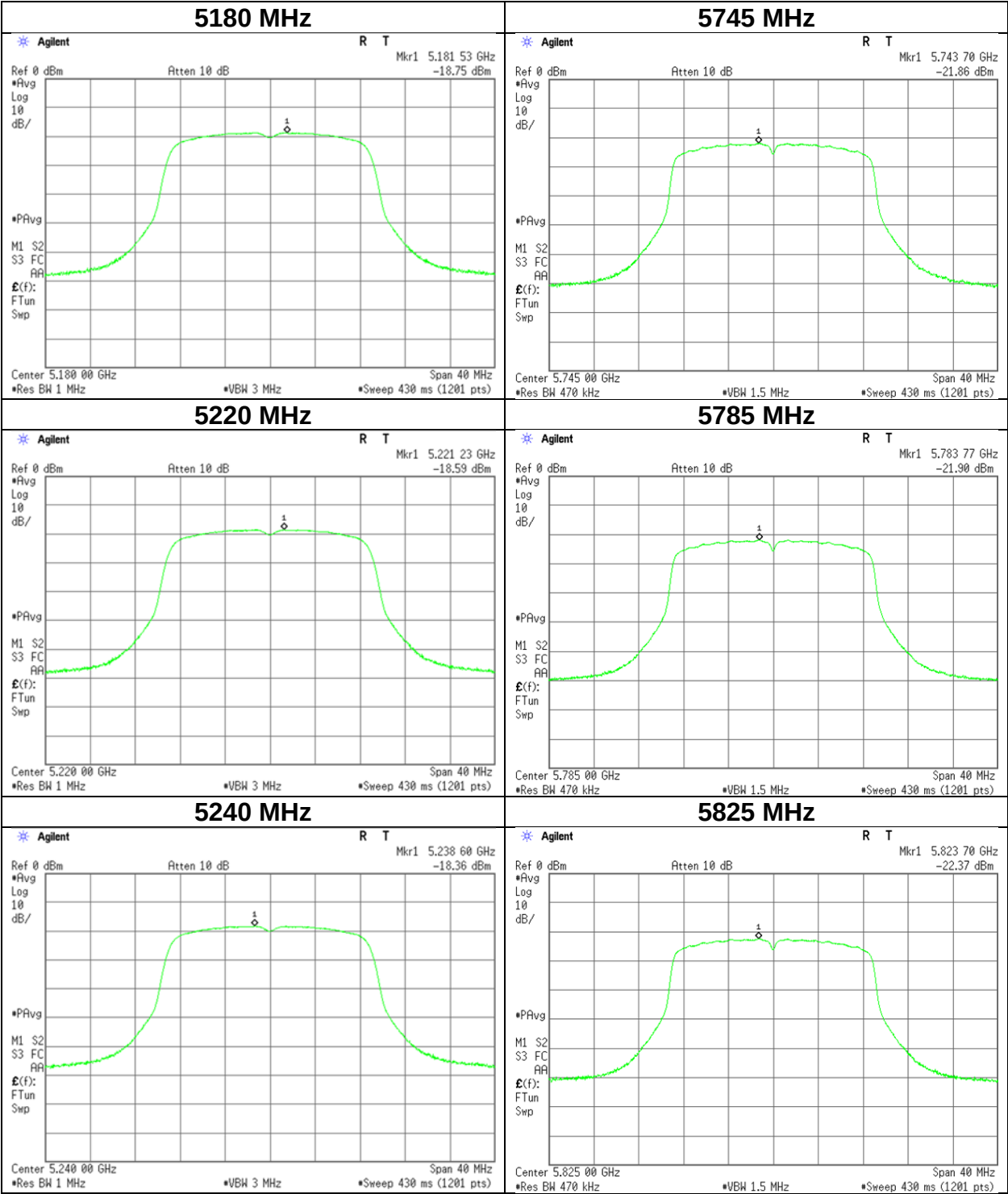
11n-20, Chain 1



Maximum Power Spectral Density

Test place	Ise EMC Lab. No. 5 Measurement Room
Date	June 27, 2024
Temperature / Humidity	23 deg. C / 50 % RH
Engineer	Shousei Hamaguchi
Mode	Tx 11ac-20

11ac-20, Chain 0



Maximum Power Spectral Density

Test place

Date

Temperature / Humidity

Engineer

Mode

Ise EMC Lab. No. 5 Measurement Room

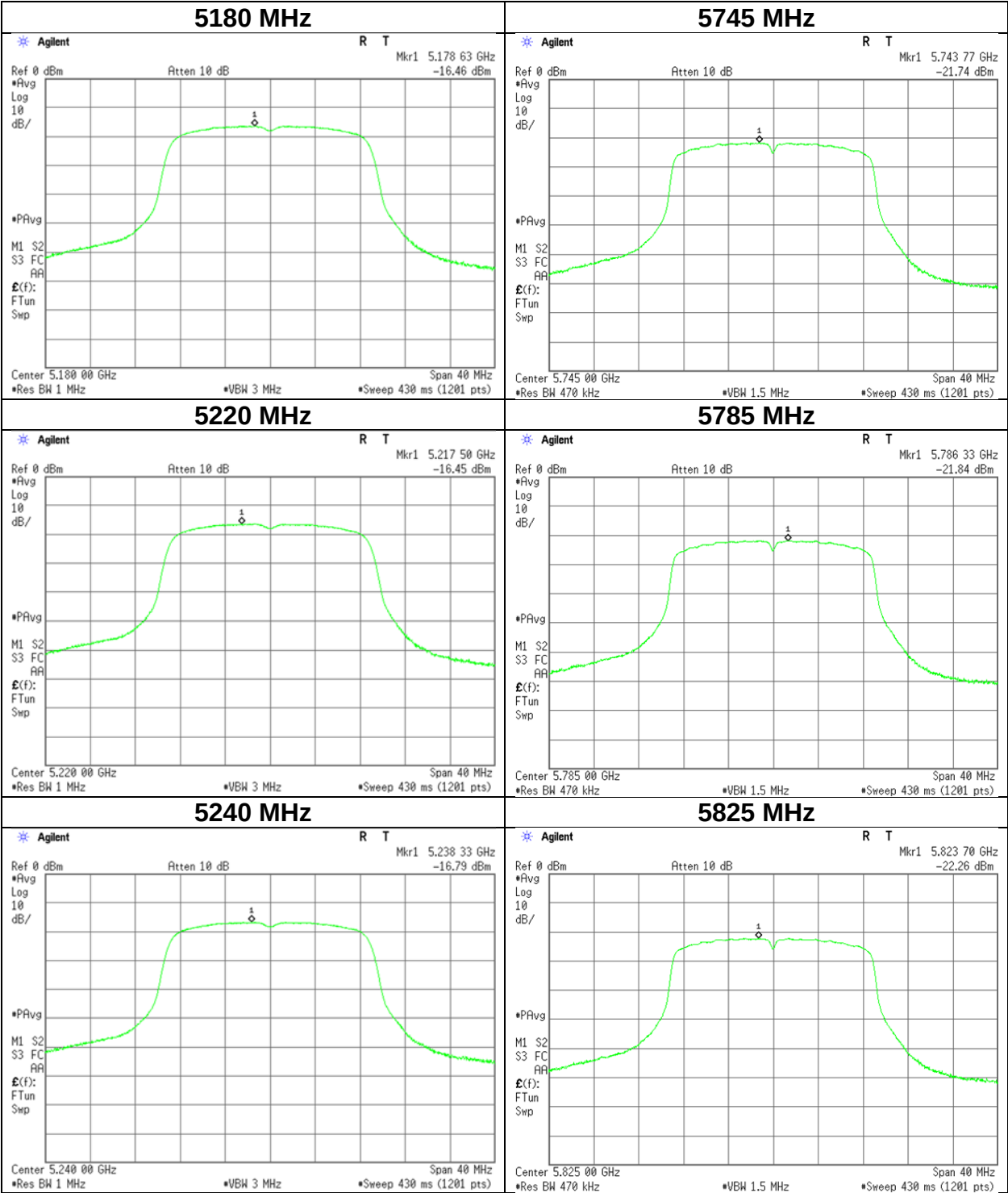
June 27, 2024

23 deg. C / 50 % RH

Shousei Hamaguchi

Tx 11ac-20

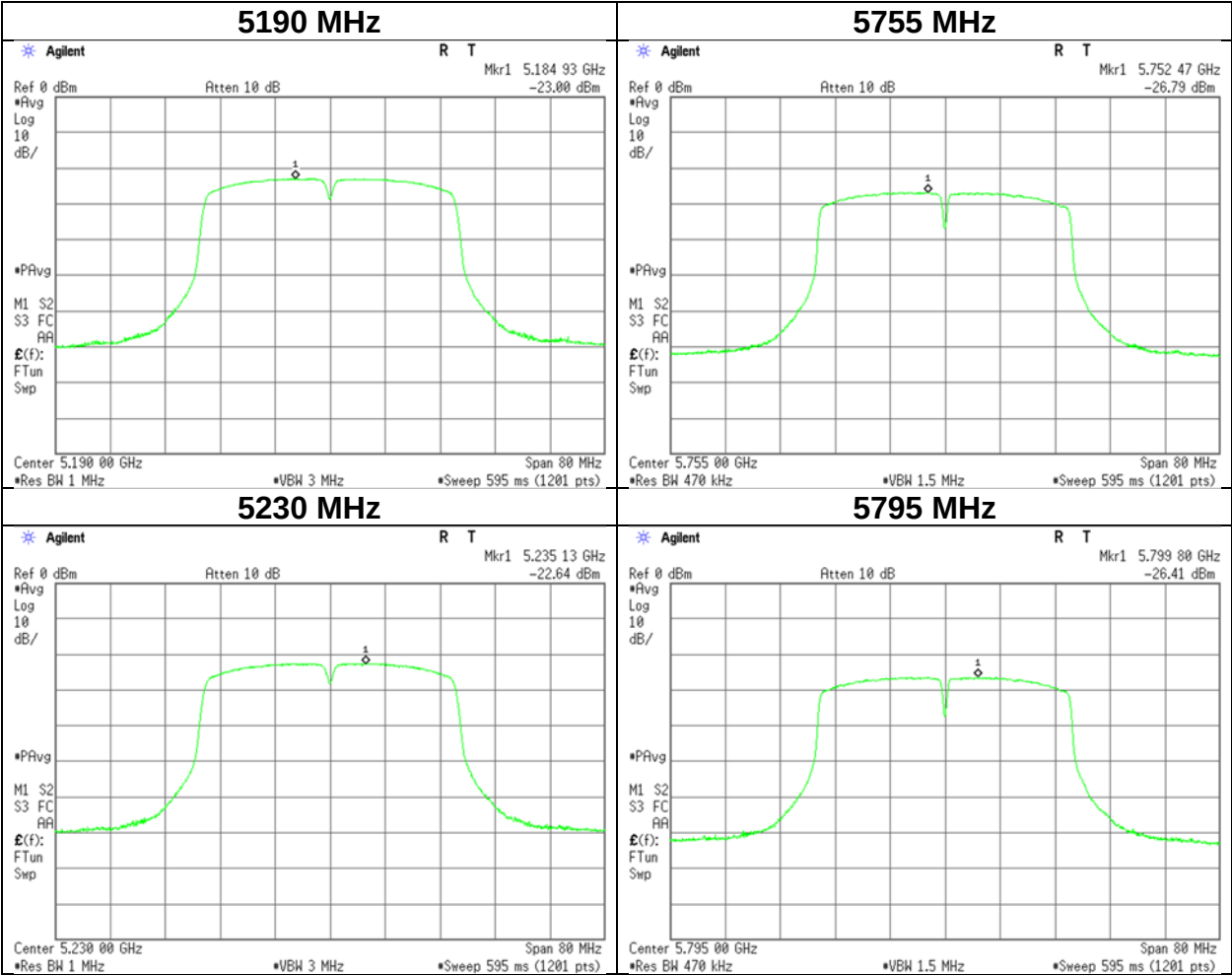
11ac-20, Chain 1



Maximum Power Spectral Density

Test place	Ise EMC Lab. No. 5 Measurement Room
Date	June 27, 2024
Temperature / Humidity	23 deg. C / 50 % RH
Engineer	Shousei Hamaguchi
Mode	Tx 11n-40

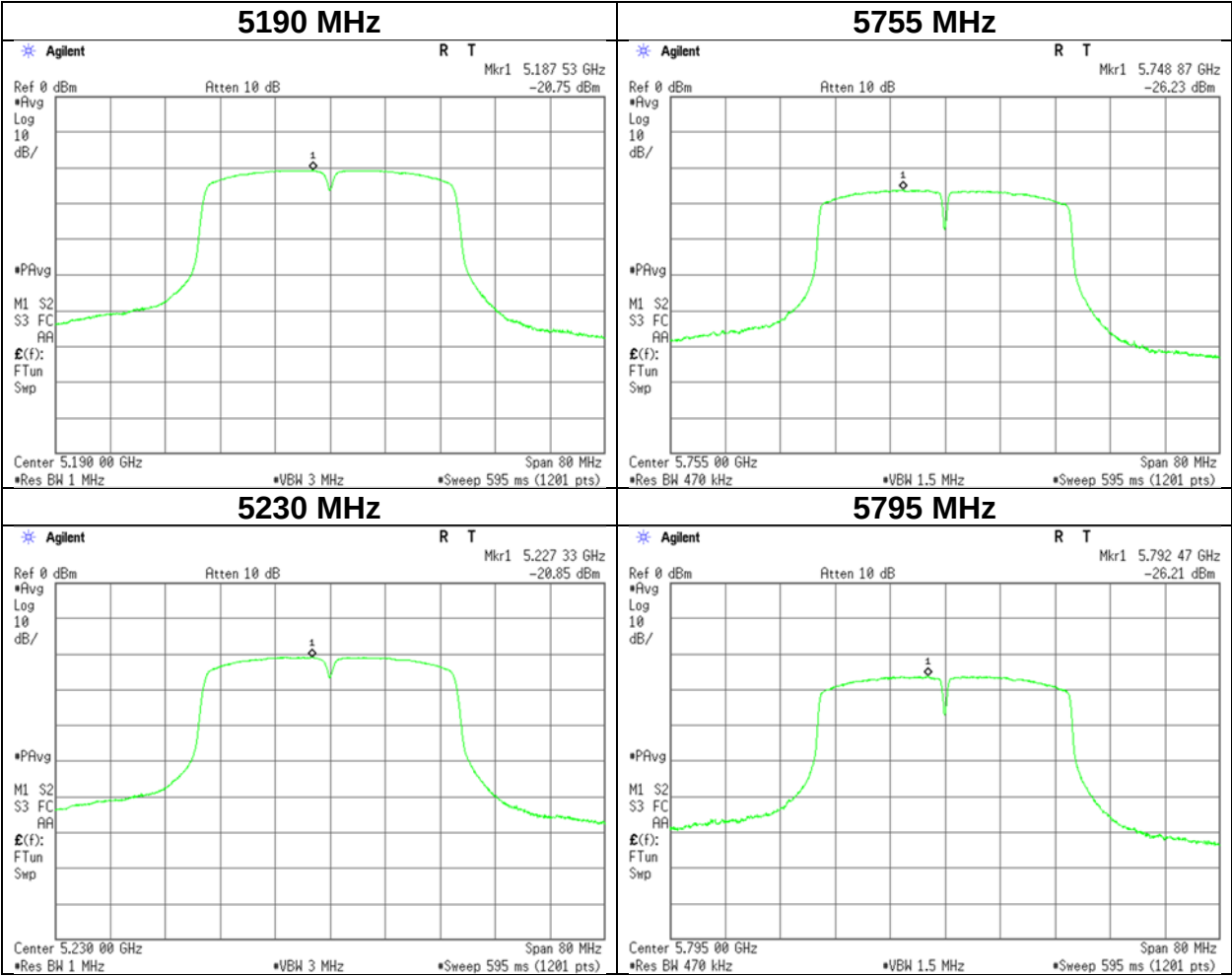
11n-40, Chain 0



Maximum Power Spectral Density

Test place	Ise EMC Lab. No. 5 Measurement Room
Date	June 27, 2024
Temperature / Humidity	23 deg. C / 50 % RH
Engineer	Shousei Hamaguchi
Mode	Tx 11n-40

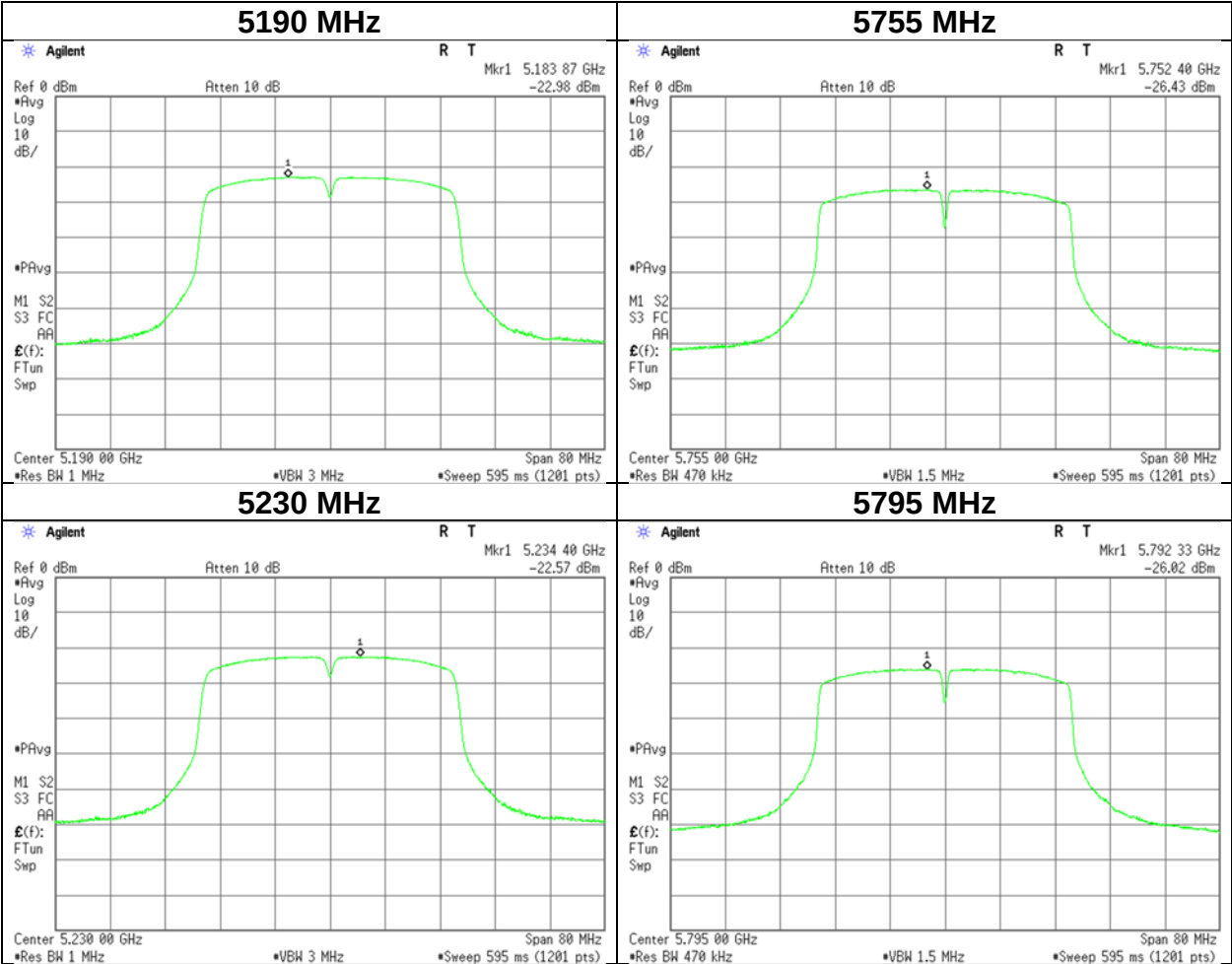
11n-40, Chain 1



Maximum Power Spectral Density

Test place	Ise EMC Lab. No. 5 Measurement Room
Date	June 27, 2024
Temperature / Humidity	23 deg. C / 50 % RH
Engineer	Shousei Hamaguchi
Mode	Tx 11ac-40

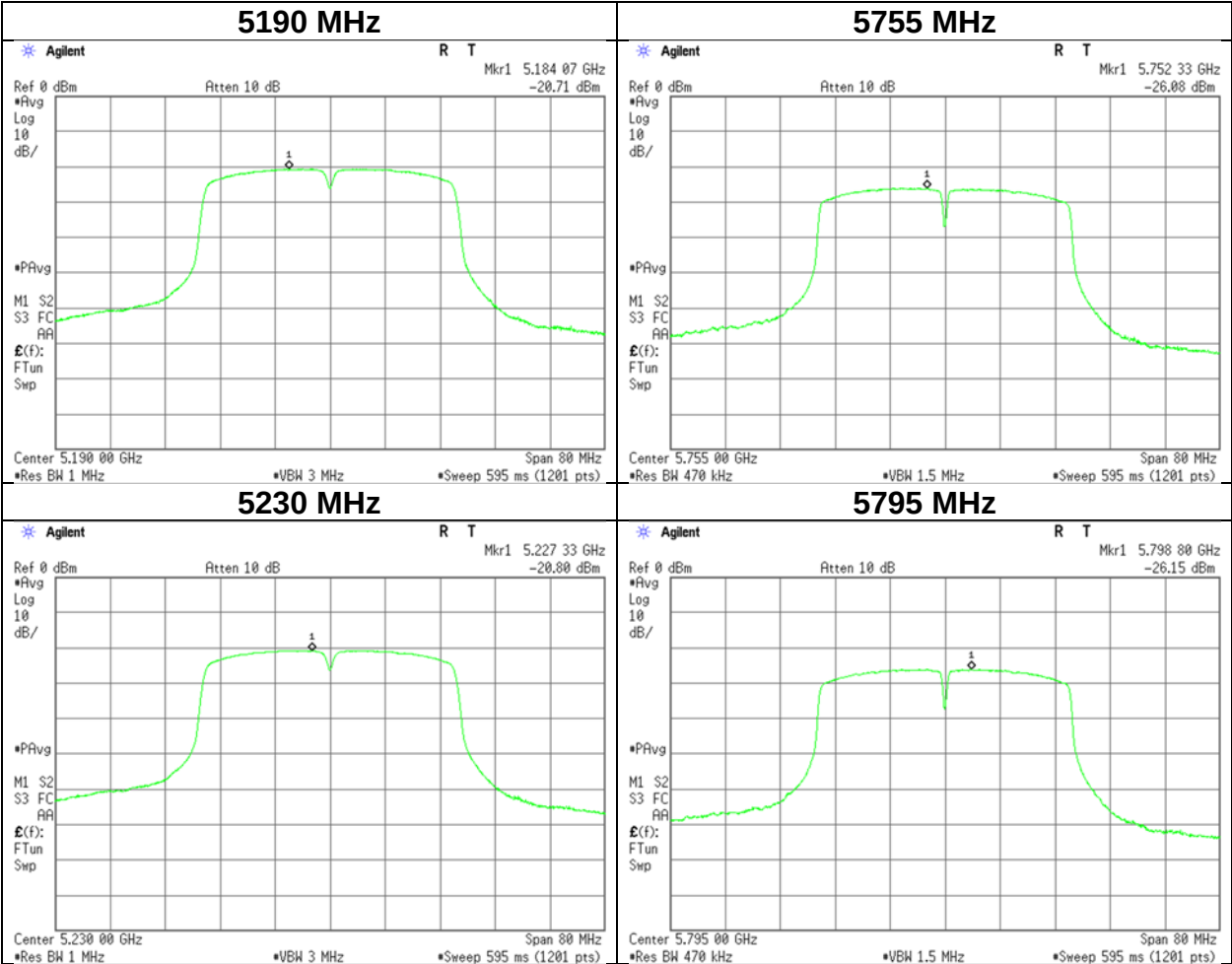
11ac-40, Chain 0



Maximum Power Spectral Density

Test place	Ise EMC Lab. No. 5 Measurement Room
Date	June 27, 2024
Temperature / Humidity	23 deg. C / 50 % RH
Engineer	Shousei Hamaguchi
Mode	Tx 11ac-40

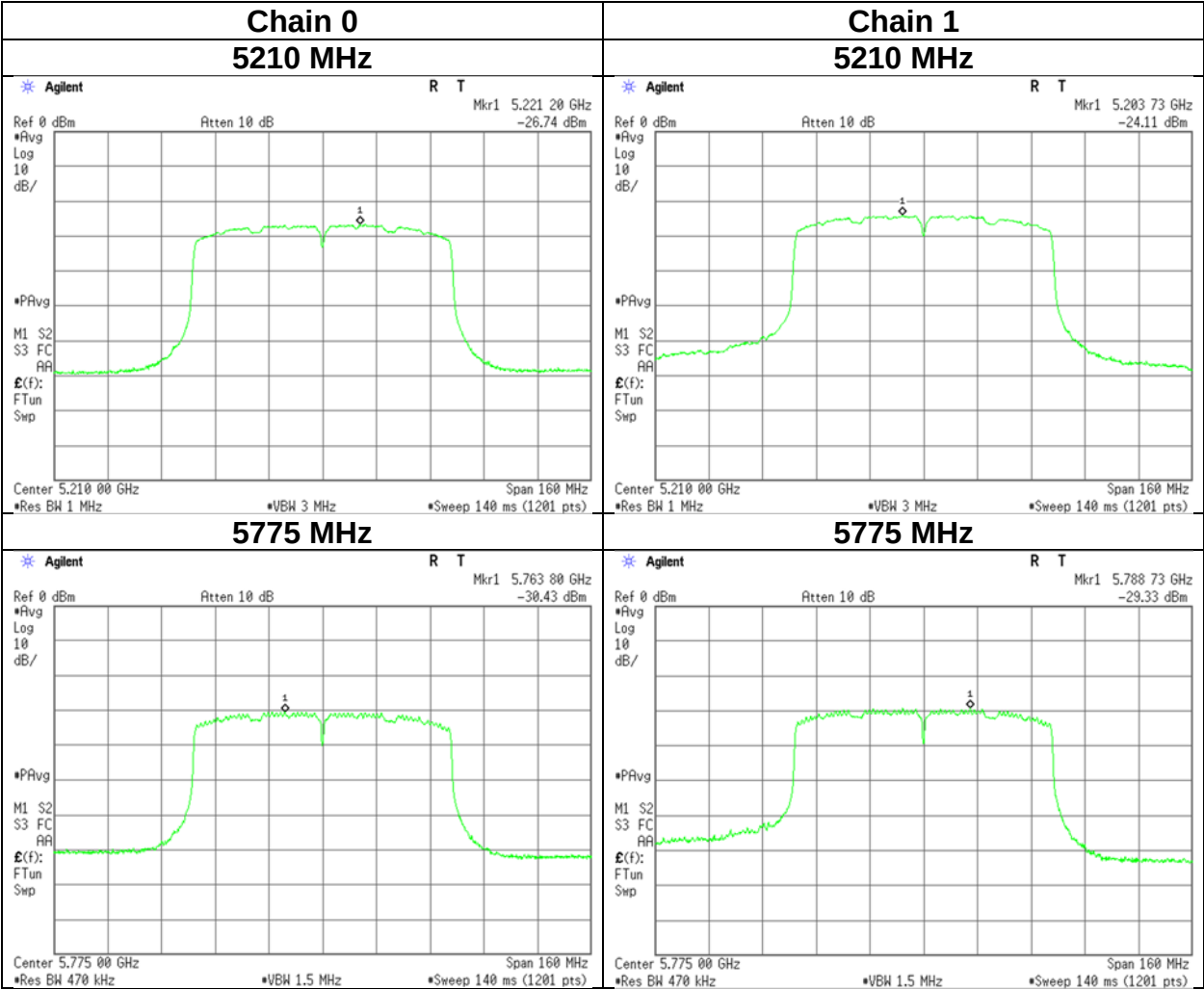
11ac-40, Chain 1



Maximum Power Spectral Density

Test place	Ise EMC Lab. No. 5 Measurement Room
Date	June 27, 2024
Temperature / Humidity	23 deg. C / 50 % RH
Engineer	Shousei Hamaguchi
Mode	Tx 11ac-80

11ac-80



Radiated Spurious Emission

Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	June 20, 2024	June 20, 2024	June 21, 2024
Temperature / Humidity	22 deg. C / 58 % RH	22 deg. C / 58 % RH	23 deg. C / 60 % RH
Engineer	Hiroki Numata	Yuta Moriya	Hiroki Numata
	(1 GHz to 6 GHz)	(6 GHz to 18 GHz)	(Above 18 GHz)
Mode	Tx 11a 5180 MHz		

Polarity	Frequency	Reading	Reading	Ant.	Loss	Gain	Duty	Result	Result	Limit	Limit	Margin	Margin	Remark
[Hori/Vert]	[MHz]	(QP / PK)	(AV)	Factor	[dB]	[dB]	[dB]	(QP / PK)	(AV)	(QP / PK)	(AV)	(QP / PK)	(AV)	
		[dBuV]	[dBuV]	[dB/m]				[dBuV/m]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dB]	[dB]	
Hori.	3509.1	52.9	-	28.8	5.0	31.7	-	55.0	-	68.2	-	13.2	-	
Hori.	5150.0	48.8	30.3	31.8	5.6	31.1	-	55.2	36.6	73.9	53.9	18.8	17.3	
Hori.	10360.0	42.5	-	35.9	-3.9	32.9	-	41.5	-	68.2	-	26.7	-	
Hori.	15540.0	42.3	32.7	39.3	-2.8	32.0	-	46.8	37.2	73.9	53.9	27.1	16.7	Floor noise
Vert.	3509.1	54.1	-	28.8	5.0	31.7	-	56.1	-	68.2	-	12.1	-	
Vert.	5150.0	48.3	30.9	31.8	5.6	31.1	-	54.6	37.2	73.9	53.9	19.3	16.7	
Vert.	10360.0	44.9	-	35.9	-3.9	32.9	-	43.9	-	68.2	-	24.3	-	
Vert.	15540.0	42.3	32.7	39.3	-2.8	32.0	-	46.8	37.2	73.9	53.9	27.1	16.7	Floor noise

Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)
Result (AV)= Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).
*QP detector was used up to 1GHz.

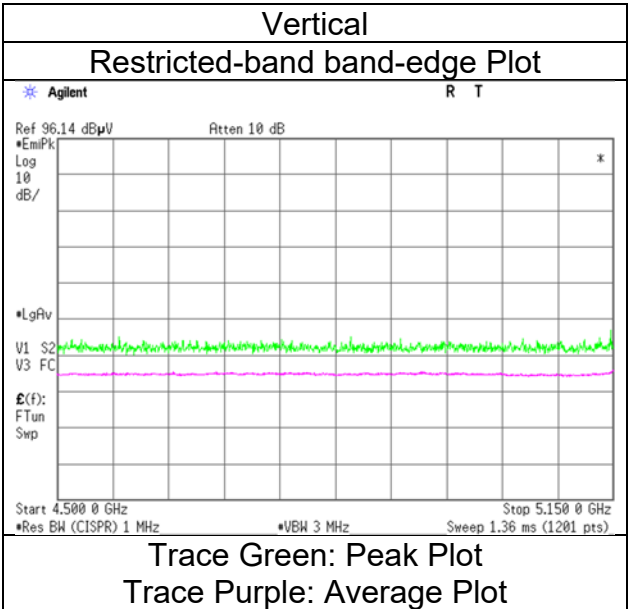
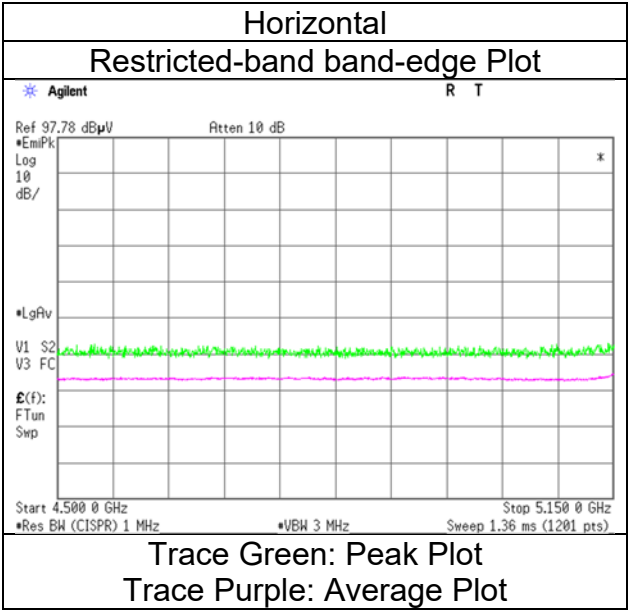
Distance factor: 1 GHz - 6 GHz 20log (3.8 m / 3.0 m) = 2.06 dB
 6 GHz - 10 GHz 20log (4.8 m / 3.0 m) = 4.09 dB
 10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place
Semi Anechoic Chamber
Date
Temperature / Humidity
Engineer

Mode

Ise EMC Lab.
No.3
June 20, 2024
22 deg. C / 58 % RH
Hiroki Numata
(1 GHz to 6 GHz)
Tx 11a 5180 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	June 20, 2024	June 20, 2024	June 21, 2024
Temperature / Humidity	22 deg. C / 58 % RH	22 deg. C / 58 % RH	23 deg. C / 60 % RH
Engineer	Hiroki Numata	Yuta Moriya	Hiroki Numata
	(1 GHz to 6 GHz)	(6 GHz to 18 GHz)	(Above 18 GHz)
Mode	Tx 11a 5220 MHz		

Polarity	Frequency	Reading	Reading	Ant.	Loss	Gain	Duty	Result	Result	Limit	Limit	Margin	Margin	Remark
[Hori/Vert]	[MHz]	(QP / PK)	(AV)	Factor	[dB]	[dB]	[dB]	(QP / PK)	(AV)	(QP / PK)	(AV)	(QP / PK)	(AV)	
		[dBuV]	[dBuV]	[dB/m]				[dBuV/m]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dB]	[dB]	
Hori.	3509.1	52.9	-	28.8	5.0	31.7	-	55.0	-	68.2	-	13.3	-	
Hori.	10440.0	42.3	-	35.9	-3.9	32.9	-	41.4	-	68.2	-	26.8	-	
Hori.	15660.0	42.7	32.6	39.4	-2.8	32.0	-	47.4	37.2	73.9	53.9	26.5	16.7	Floor noise
Vert.	3509.1	54.5	-	28.8	5.0	31.7	-	56.5	-	68.2	-	11.7	-	
Vert.	10440.0	43.2	-	35.9	-3.9	32.9	-	42.4	-	68.2	-	25.9	-	
Vert.	15660.0	42.7	32.5	39.4	-2.8	32.0	-	47.4	37.2	73.9	53.9	26.5	16.7	Floor noise

Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)
Result (AV)= Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).
*QP detector was used up to 1GHz.

Distance factor: 1 GHz - 6 GHz 20log (3.8 m / 3.0 m) = 2.06 dB
 6 GHz - 10 GHz 20log (4.8 m / 3.0 m) = 4.09 dB
 10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	June 20, 2024	June 20, 2024	June 21, 2024
Temperature / Humidity	22 deg. C / 58 % RH	22 deg. C / 58 % RH	23 deg. C / 60 % RH
Engineer	Hiroki Numata	Yuta Moriya	Hiroki Numata
	(1 GHz to 6 GHz)	(6 GHz to 18 GHz)	(Above 18 GHz)
Mode	Tx 11a 5240 MHz		

Polarity	Frequency	Reading	Reading	Ant.	Loss	Gain	Duty	Result	Result	Limit	Limit	Margin	Margin	Remark
[Hori/Vert]	[MHz]	(QP / PK)	(AV)	Factor	[dB]	[dB]	[dB]	(QP / PK)	(AV)	(QP / PK)	(AV)	(QP / PK)	(AV)	
		[dBuV]	[dBuV]	[dB/m]				[dBuV/m]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dB]	[dB]	
Hori.	3509.1	52.9	-	28.8	5.0	31.7	-	54.9	-	68.2	-	13.3	-	
Hori.	5350.0	39.5	30.5	31.6	5.7	31.1	-	45.6	36.7	73.9	53.9	28.3	17.2	
Hori.	10480.0	44.0	-	36.0	-3.9	32.9	-	43.3	-	68.2	-	24.9	-	
Hori.	15720.0	42.9	32.6	39.5	-2.8	32.0	-	47.6	37.3	73.9	53.9	26.3	16.6	Floor noise
Vert.	3509.1	54.6	-	28.8	5.0	31.7	-	56.6	-	68.2	-	11.6	-	
Vert.	5350.0	40.8	30.5	31.6	5.7	31.1	-	47.0	36.7	73.9	53.9	27.0	17.2	
Vert.	10480.0	43.1	-	36.0	-3.9	32.9	-	42.3	-	68.2	-	25.9	-	
Vert.	15720.0	43.0	32.6	39.5	-2.8	32.0	-	47.7	37.4	73.9	53.9	26.2	16.6	Floor noise

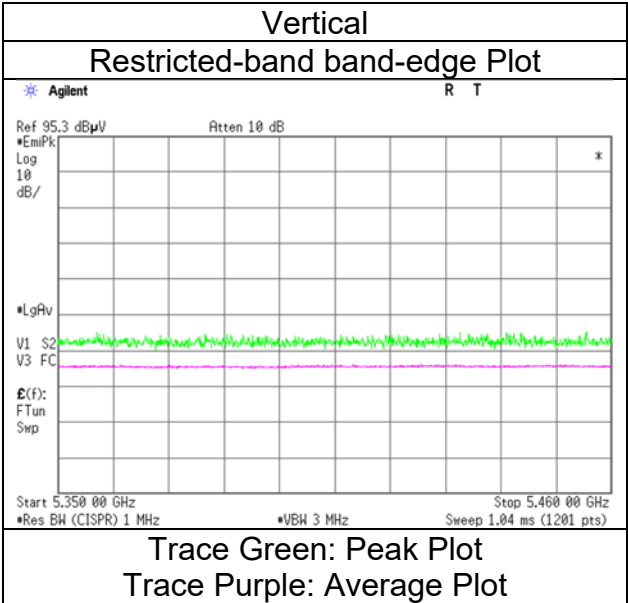
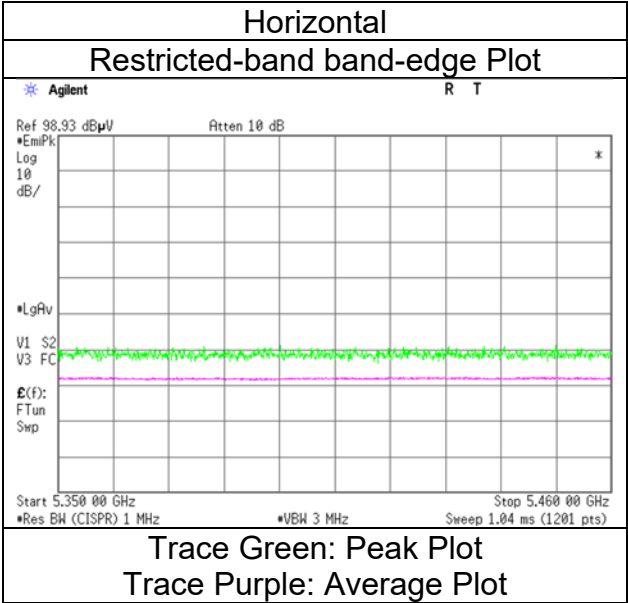
Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)
Result (AV)= Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).
*QP detector was used up to 1GHz.

Distance factor: 1 GHz - 6 GHz 20log (3.8 m / 3.0 m) = 2.06 dB
 6 GHz - 10 GHz 20log (4.8 m / 3.0 m) = 4.09 dB
 10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place
Semi Anechoic Chamber
Date
Temperature / Humidity
Engineer
Mode

Ise EMC Lab.
No.3
June 20, 2024
22 deg. C / 58 % RH
Hiroki Numata
Tx 11a 5240 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	June 20, 2024	June 20, 2024	June 21, 2024
Temperature / Humidity	22 deg. C / 58 % RH	22 deg. C / 58 % RH	23 deg. C / 60 % RH
Engineer	Hiroki Numata	Yuta Moriya	Hiroki Numata
	(1 GHz to 6 GHz)	(6 GHz to 18 GHz)	(Above 18 GHz)
Mode	Tx 11a 5745 MHz		

Polarity	Frequency	Reading	Reading	Ant.	Loss	Gain	Duty	Result	Result	Limit	Limit	Margin	Margin	Remark
[Hori/Vert]	[MHz]	(QP / PK)	(AV)	Factor	[dB]	[dB]	Factor	(QP / PK)	(AV)	(QP / PK)	(AV)	(QP / PK)	(AV)	
		[dBuV]	[dBuV]	[dB/m]			[dB]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dB]	[dB]	
Hori.	3509.1	53.0	-	28.8	5.0	31.7	-	55.1	-	68.2	-	13.2	-	
Hori.	5650.0	40.2	-	31.7	5.8	31.2	-	46.6	-	68.2	-	21.6	-	
Hori.	5700.0	40.4	-	31.8	5.8	31.2	-	46.9	-	105.2	-	58.3	-	
Hori.	5720.0	47.9	-	31.9	5.8	31.2	-	54.5	-	110.8	-	56.3	-	
Hori.	5725.0	49.7	-	31.9	5.8	31.2	-	56.3	-	122.2	-	65.9	-	
Hori.	11490.0	43.1	33.7	37.5	-3.6	32.8	-	44.2	34.8	73.9	53.9	29.7	19.1	
Hori.	17235.0	42.5	-	39.7	-2.4	31.9	-	48.0	-	68.2	-	20.2	-	Floor noise
Vert.	3509.1	54.5	-	28.8	5.0	31.7	-	56.5	-	68.2	-	11.7	-	
Vert.	5650.0	40.4	-	31.7	5.8	31.2	-	46.8	-	68.2	-	21.4	-	
Vert.	5700.0	40.5	-	31.8	5.8	31.2	-	47.0	-	105.2	-	58.2	-	
Vert.	5720.0	47.9	-	31.9	5.8	31.2	-	54.5	-	110.8	-	56.3	-	
Vert.	5725.0	49.4	-	31.9	5.8	31.2	-	56.0	-	122.2	-	66.2	-	
Vert.	11490.0	43.2	33.8	37.5	-3.6	32.8	-	44.3	34.9	73.9	53.9	29.6	19.0	
Vert.	17235.0	42.5	-	39.7	-2.4	31.9	-	48.0	-	68.2	-	20.2	-	Floor noise

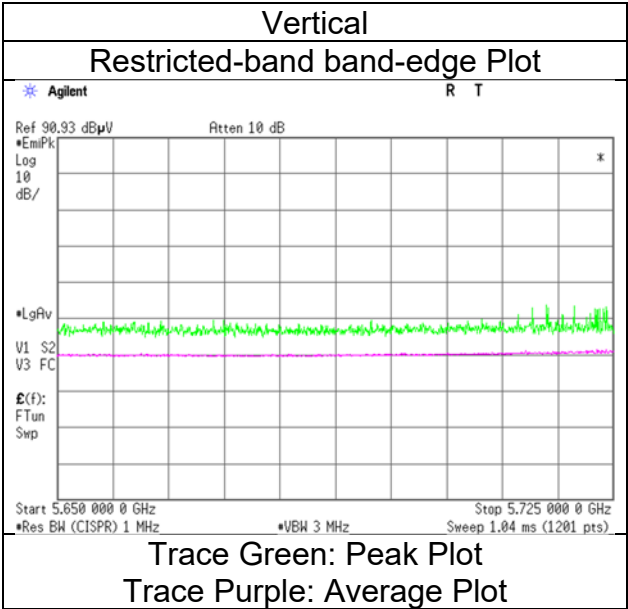
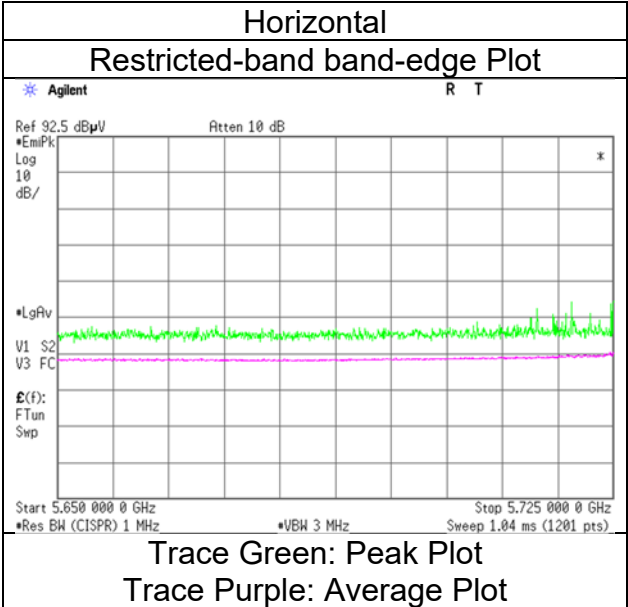
Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)
Result (AV)= Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).
*QP detector was used up to 1GHz.

Distance factor: 1 GHz - 6 GHz 20log (3.8 m / 3.0 m) = 2.06 dB
 6 GHz - 10 GHz 20log (4.8 m / 3.0 m) = 4.09 dB
 10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place
Semi Anechoic Chamber
Date
Temperature / Humidity
Engineer
Mode

Ise EMC Lab.
No.3
June 20, 2024
22 deg. C / 58 % RH
Hiroki Numata
Tx 11a 5745 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	June 20, 2024	June 20, 2024	June 21, 2024
Temperature / Humidity	22 deg. C / 58 % RH	22 deg. C / 58 % RH	23 deg. C / 60 % RH
Engineer	Hiroki Numata	Yuta Moriya	Hiroki Numata
	(1 GHz to 6 GHz)	(6 GHz to 18 GHz)	(Above 18 GHz)
Mode	Tx 11a 5785 MHz		

Polarity	Frequency	Reading	Reading	Ant.	Loss	Gain	Duty	Result	Result	Limit	Limit	Margin	Margin	Remark
[Hori/Vert]	[MHz]	(QP / PK)	(AV)	Factor	[dB]	[dB]	[dB]	(QP / PK)	(AV)	(QP / PK)	(AV)	(QP / PK)	(AV)	
		[dBuV]	[dBuV]	[dB/m]				[dBuV/m]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dB]	[dB]	
Hori.	3509.1	53.1	-	28.8	5.0	31.7	-	55.1	-	68.2	-	13.1	-	
Hori.	11570.0	43.9	33.9	37.5	-3.6	32.8	-	45.1	35.0	73.9	53.9	28.8	18.9	
Hori.	17355.0	42.6	-	39.8	-2.3	31.9	-	48.2	-	68.2	-	20.0	-	Floor noise
Vert.	3509.1	54.6	-	28.8	5.0	31.7	-	56.6	-	68.2	-	11.6	-	
Vert.	11570.0	44.5	35.0	37.5	-3.6	32.8	-	45.7	36.2	73.9	53.9	28.2	17.8	
Vert.	17355.0	42.7	-	39.8	-2.3	31.9	-	48.3	-	68.2	-	19.9	-	Floor noise

Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)
Result (AV)= Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).
*QP detector was used up to 1GHz.

Distance factor: 1 GHz - 6 GHz 20log (3.8 m / 3.0 m) = 2.06 dB
 6 GHz - 10 GHz 20log (4.8 m / 3.0 m) = 4.09 dB
 10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place
Semi Anechoic Chamber
Date
Temperature / Humidity
Engineer
Mode

Ise EMC Lab.
No.3
June 20, 2024
22 deg. C / 58 % RH
Hiroki Numata
(1 GHz to 6 GHz)
Tx 11a 5825 MHz

No.3
June 20, 2024
22 deg. C / 58 % RH
Yuta Moriya
(6 GHz to 18 GHz)

No.3
June 21, 2024
23 deg. C / 60 % RH
Hiroki Numata
(Above 18 GHz)

Polarity	Frequency	Reading	Reading	Ant.	Loss	Gain	Duty	Result	Result	Limit	Limit	Margin	Margin	Remark
[Hori/Vert]	[MHz]	(QP / PK) [dBuV]	(AV) [dBuV]	Factor [dB/m]	[dB]	[dB]	[dB]	(QP / PK) [dBuV/m]	(AV) [dBuV/m]	(QP / PK) [dBuV/m]	(AV) [dBuV/m]	(QP / PK) [dB]	(AV) [dB]	
Hori.	3509.1	53.9	-	28.8	5.0	31.7	-	56.0	-	68.2	-	12.3	-	
Hori.	5850.0	43.8	-	32.2	5.9	31.2	-	50.8	-	122.2	-	71.4	-	
Hori.	5855.0	41.8	-	32.2	5.9	31.2	-	48.7	-	110.8	-	62.1	-	
Hori.	5875.0	41.3	-	32.2	5.9	31.2	-	48.2	-	105.2	-	57.0	-	
Hori.	5925.0	39.8	-	32.3	5.9	31.2	-	46.8	-	68.2	-	21.4	-	
Hori.	11650.0	44.2	33.9	37.6	-3.6	32.7	-	45.5	35.1	73.9	53.9	28.4	18.8	
Hori.	17475.0	42.8	-	39.9	-2.3	31.9	-	48.5	-	68.2	-	19.7	-	Floor noise
Vert.	3509.1	54.1	-	28.8	5.0	31.7	-	56.1	-	68.2	-	12.1	-	
Vert.	5850.0	41.3	-	32.2	5.9	31.2	-	48.3	-	122.2	-	73.9	-	
Vert.	5855.0	41.0	-	32.2	5.9	31.2	-	48.0	-	110.8	-	62.8	-	
Vert.	5875.0	40.9	-	32.2	5.9	31.2	-	47.9	-	105.2	-	57.3	-	
Vert.	5925.0	39.7	-	32.3	5.9	31.2	-	46.8	-	68.2	-	21.4	-	
Vert.	11650.0	45.0	35.0	37.6	-3.6	32.7	-	46.3	36.2	73.9	53.9	27.6	17.7	
Vert.	17475.0	42.8	-	39.9	-2.3	31.9	-	48.5	-	68.2	-	19.7	-	Floor noise

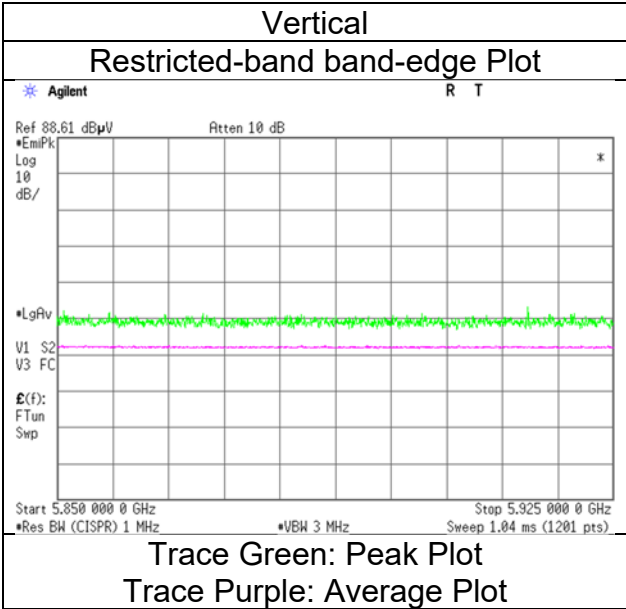
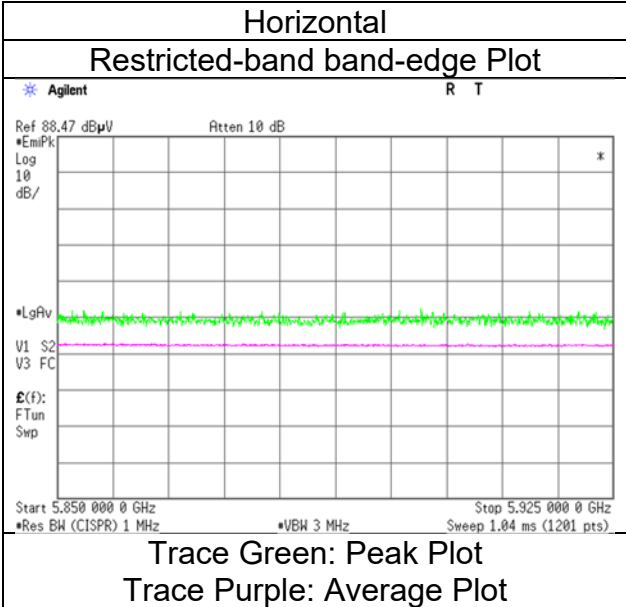
Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)
Result (AV)= Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).
*QP detector was used up to 1GHz.

Distance factor: 1 GHz - 6 GHz 20log (3.8 m / 3.0 m) = 2.06 dB
 6 GHz - 10 GHz 20log (4.8 m / 3.0 m) = 4.09 dB
 10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place
Semi Anechoic Chamber
Date
Temperature / Humidity
Engineer
Mode

Ise EMC Lab.
No.3
June 20, 2024
22 deg. C / 58 % RH
Hiroki Numata
Tx 11a 5825 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	June 20, 2024	June 20, 2024	June 21, 2024
Temperature / Humidity	22 deg. C / 58 % RH	22 deg. C / 58 % RH	23 deg. C / 60 % RH
Engineer	Hiroki Numata	Yuta Moriya	Hiroki Numata
	(1 GHz to 6 GHz)	(6 GHz to 18 GHz)	(Above 18 GHz)
Mode	Tx 11ac-20 5180 MHz		

Polarity	Frequency	Reading	Reading	Ant.	Loss	Gain	Duty	Result	Result	Limit	Limit	Margin	Margin	Remark
[Hori/Vert]	[MHz]	(QP / PK)	(AV)	Factor	[dB]	[dB]	[dB]	(QP / PK)	(AV)	(QP / PK)	(AV)	(QP / PK)	(AV)	
		[dBuV]	[dBuV]	[dB/m]				[dBuV/m]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dB]	[dB]	
Hori.	3509.1	53.0	-	28.8	5.0	31.7	-	55.0	-	68.2	-	13.2	-	
Hori.	5150.0	46.9	31.7	31.8	5.6	31.1	-	53.2	38.0	73.9	53.9	20.7	15.9	
Hori.	10360.0	43.7	-	35.9	-3.9	32.9	-	42.8	-	68.2	-	25.4	-	
Hori.	15540.0	42.2	32.6	39.3	-2.8	32.0	-	46.7	37.1	73.9	53.9	27.2	16.8	Floor noise
Vert.	3509.1	54.1	-	28.8	5.0	31.7	-	56.1	-	68.2	-	12.1	-	
Vert.	5150.0	48.5	31.3	31.8	5.6	31.1	-	54.8	37.6	73.9	53.9	19.1	16.3	
Vert.	10360.0	43.2	-	35.9	-3.9	32.9	-	42.3	-	68.2	-	25.9	-	
Vert.	15540.0	42.2	32.7	39.3	-2.8	32.0	-	46.7	37.2	73.9	53.9	27.2	16.8	Floor noise

Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)
Result (AV)= Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).
*QP detector was used up to 1GHz.

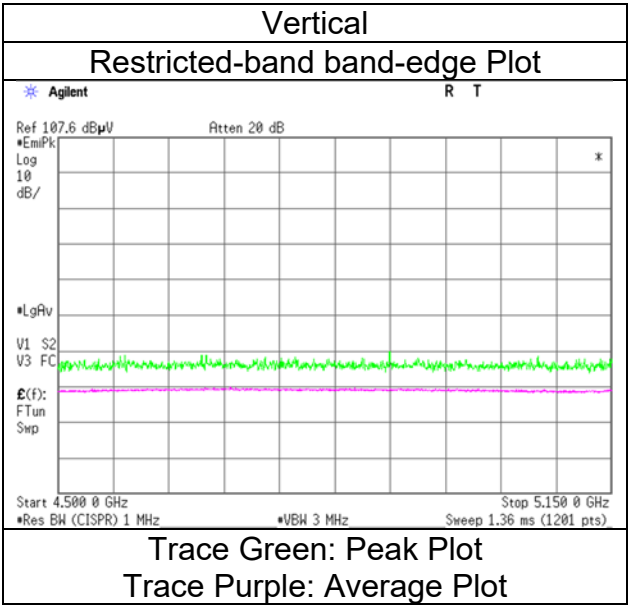
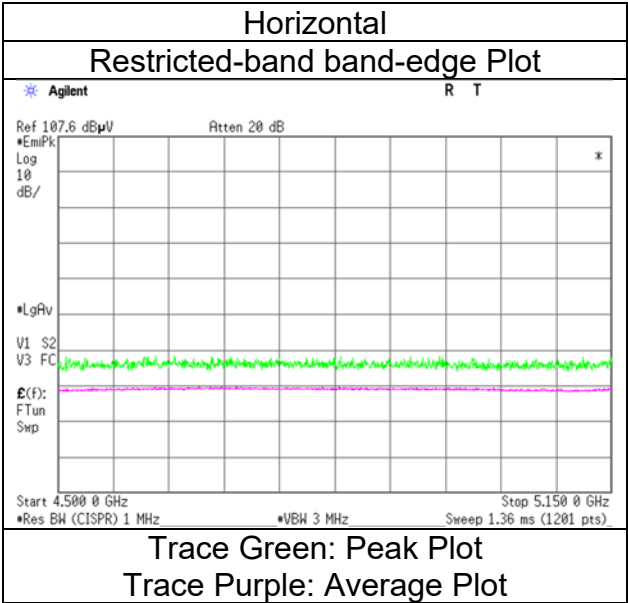
Distance factor: 1 GHz - 6 GHz 20log (3.8 m / 3.0 m) = 2.06 dB
 6 GHz - 10 GHz 20log (4.8 m / 3.0 m) = 4.09 dB
 10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place
Semi Anechoic Chamber
Date
Temperature / Humidity
Engineer

Mode

Ise EMC Lab.
No.3
June 20, 2024
22 deg. C / 58 % RH
Hiroki Numata
(1 GHz to 6 GHz)
Tx 11ac-20 5180 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Test place	Ise EMC Lab.			
Semi Anechoic Chamber	No.3	No.3	No.3	No.3
Date	June 20, 2024	June 20, 2024	June 21, 2024	June 23, 2024
Temperature / Humidity	22 deg. C / 58 % RH	22 deg. C / 58 % RH	23 deg. C / 60 % RH	22 deg. C / 59 % RH
Engineer	Hiroki Numata	Yuta Moriya	Hiroki Numata	Hiroki Numata
	(1 GHz to 6 GHz)	(6 GHz to 18 GHz)	(Above 18 GHz)	(Below 1 GHz)
Mode	Tx 11ac-20 5220 MHz			

Polarity	Frequency	Reading	Reading	Ant.	Loss	Gain	Duty	Result	Result	Limit	Limit	Margin	Margin	Remark
[Hori/Vert]	[MHz]	(QP / PK)	(AV)	Factor	[dB]	[dB]	Factor	(QP / PK)	(AV)	(QP / PK)	(AV)	(QP / PK)	(AV)	
[dBuV]	[dBuV]	[dBm]	[dB]	[dB]	[dB]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dB]	[dB]	
Hori.	47.4	30.7	-	12.1	7.2	32.2	-	17.8	-	40.0	-	22.2	-	
Hori.	148.6	34.5	-	14.8	8.4	32.1	-	25.6	-	43.5	-	17.9	-	
Hori.	168.7	27.5	-	15.8	8.6	32.1	-	19.8	-	43.5	-	23.7	-	
Hori.	221.2	40.4	-	11.3	9.0	32.0	-	28.6	-	46.0	-	17.4	-	
Hori.	310.6	32.5	-	13.7	9.7	32.0	-	23.9	-	46.0	-	22.1	-	
Hori.	449.8	28.1	-	16.5	10.6	32.0	-	23.2	-	46.0	-	22.8	-	
Hori.	3509.1	53.0	-	28.8	5.0	31.7	-	55.0	-	68.2	-	13.2	-	
Hori.	10440.0	44.2	-	35.9	-3.9	32.9	-	43.3	-	68.2	-	24.9	-	
Hori.	15660.0	42.6	32.4	39.4	-2.8	32.0	-	47.3	37.1	73.9	53.9	26.6	16.8	Floor noise
Vert.	44.2	37.4	-	13.3	7.1	32.2	-	25.6	-	40.0	-	14.4	-	
Vert.	56.7	44.6	-	9.0	7.3	32.2	-	28.7	-	40.0	-	11.3	-	
Vert.	148.6	35.1	-	14.8	8.4	32.1	-	26.2	-	43.5	-	17.3	-	
Vert.	221.2	38.4	-	11.3	9.0	32.0	-	26.6	-	46.0	-	19.4	-	
Vert.	371.8	29.3	-	15.0	10.1	32.0	-	22.4	-	46.0	-	23.6	-	
Vert.	504.3	26.0	-	17.8	10.9	32.0	-	22.7	-	46.0	-	23.3	-	
Vert.	3509.1	54.9	-	28.8	5.0	31.7	-	57.0	-	68.2	-	11.2	-	
Vert.	10440.0	42.5	-	35.9	-3.9	32.9	-	41.6	-	68.2	-	26.6	-	
Vert.	15660.0	42.6	32.5	39.4	-2.8	32.0	-	47.3	37.1	73.9	53.9	26.6	16.8	Floor noise

Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)
Result (AV)= Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).
*QP detector was used up to 1GHz.

Distance factor: 1 GHz - 6 GHz 20log (3.8 m / 3.0 m) = 2.06 dB
 6 GHz - 10 GHz 20log (4.8 m / 3.0 m) = 4.09 dB
 10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	June 20, 2024	June 20, 2024	June 21, 2024
Temperature / Humidity	22 deg. C / 58 % RH	22 deg. C / 58 % RH	23 deg. C / 60 % RH
Engineer	Hiroki Numata	Yuta Moriya	Hiroki Numata
	(1 GHz to 6 GHz)	(6 GHz to 18 GHz)	(Above 18 GHz)
Mode	Tx 11ac-20 5240 MHz		

Polarity	Frequency	Reading	Reading	Ant.	Loss	Gain	Duty	Result	Result	Limit	Limit	Margin	Margin	Remark
[Hori/Vert]	[MHz]	(QP / PK)	(AV)	Factor	[dB]	[dB]	[dB]	(QP / PK)	(AV)	(QP / PK)	(AV)	(QP / PK)	(AV)	
		[dBuV]	[dBuV]	[dB/m]				[dBuV/m]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dB]	[dB]	
Hori.	3509.1	52.8	-	28.8	5.0	31.7	-	54.9	-	68.2	-	13.3	-	
Hori.	5350.0	40.3	30.5	31.6	5.7	31.1	-	46.5	36.6	73.9	53.9	27.4	17.3	
Hori.	10480.0	43.1	-	36.0	-3.9	32.9	-	42.3	-	68.2	-	25.9	-	
Hori.	15720.0	42.9	32.6	39.5	-2.8	32.0	-	47.6	37.3	73.9	53.9	26.3	16.6	Floor noise
Vert.	3509.1	54.4	-	28.8	5.0	31.7	-	56.4	-	68.2	-	11.8	-	
Vert.	5350.0	40.0	30.7	31.6	5.7	31.1	-	46.2	36.9	73.9	53.9	27.7	17.1	
Vert.	10480.0	43.1	-	36.0	-3.9	32.9	-	42.3	-	68.2	-	25.9	-	
Vert.	15720.0	42.8	32.6	39.5	-2.8	32.0	-	47.6	37.3	73.9	53.9	26.4	16.6	Floor noise

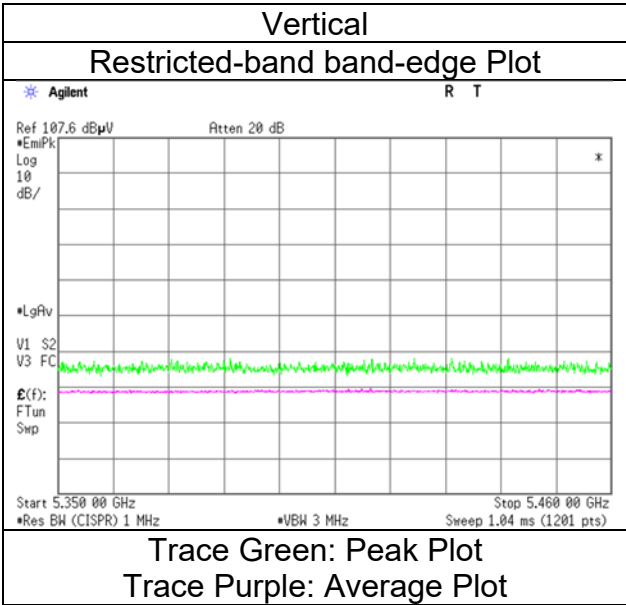
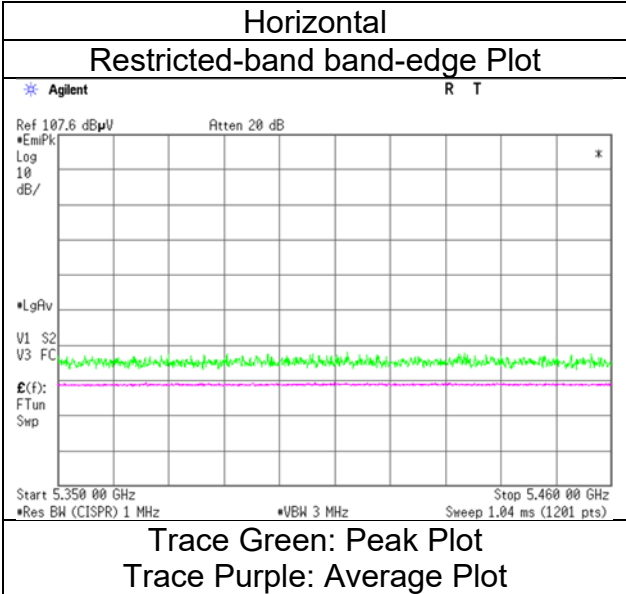
Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)
Result (AV)= Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).
*QP detector was used up to 1GHz.

Distance factor: 1 GHz - 6 GHz 20log (3.8 m / 3.0 m) = 2.06 dB
 6 GHz - 10 GHz 20log (4.8 m / 3.0 m) = 4.09 dB
 10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place
Semi Anechoic Chamber
Date
Temperature / Humidity
Engineer
Mode

Ise EMC Lab.
No.3
June 20, 2024
22 deg. C / 58 % RH
Hiroki Numata
Tx 11ac-20 5240 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	June 20, 2024	June 20, 2024	June 21, 2024
Temperature / Humidity	22 deg. C / 58 % RH	22 deg. C / 58 % RH	23 deg. C / 60 % RH
Engineer	Hiroki Numata	Yuta Moriya	Hiroki Numata
	(1 GHz to 6 GHz)	(6 GHz to 18 GHz)	(Above 18 GHz)
Mode	Tx 11ac-20 5745 MHz		

Polarity	Frequency	Reading	Reading	Ant.	Loss	Gain	Duty	Result	Result	Limit	Limit	Margin	Margin	Remark
[Hori/Vert]	[MHz]	(QP / PK)	(AV)	Factor	[dB]	[dB]	Factor	(QP / PK)	(AV)	(QP / PK)	(AV)	(QP / PK)	(AV)	
		[dBuV]	[dBuV]	[dB/m]			[dB]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dB]	[dB]	
Hori.	3509.1	52.7	-	28.8	5.0	31.7	-	54.7	-	68.2	-	13.5	-	
Hori.	5650.0	40.3	-	31.7	5.8	31.2	-	46.7	-	68.2	-	21.5	-	
Hori.	5700.0	40.8	-	31.8	5.8	31.2	-	47.3	-	105.2	-	57.9	-	
Hori.	5720.0	45.0	-	31.9	5.8	31.2	-	51.6	-	110.8	-	59.2	-	
Hori.	5725.0	47.2	-	31.9	5.8	31.2	-	53.8	-	122.2	-	68.4	-	
Hori.	11490.0	43.9	35.5	37.5	-3.6	32.8	-	45.0	36.6	73.9	53.9	28.9	17.3	
Hori.	17235.0	42.4	-	39.7	-2.4	31.9	-	47.9	-	68.2	-	20.3	-	Floor noise
Vert.	3509.1	54.6	-	28.8	5.0	31.7	-	56.7	-	68.2	-	11.5	-	
Vert.	5650.0	40.5	-	31.7	5.8	31.2	-	46.9	-	68.2	-	21.3	-	
Vert.	5700.0	40.6	-	31.8	5.8	31.2	-	47.1	-	105.2	-	58.2	-	
Vert.	5720.0	46.3	-	31.9	5.8	31.2	-	52.9	-	110.8	-	57.9	-	
Vert.	5725.0	48.2	-	31.9	5.8	31.2	-	54.8	-	122.2	-	67.4	-	
Vert.	11490.0	43.3	33.6	37.5	-3.6	32.8	-	44.4	34.7	73.9	53.9	29.5	19.2	
Vert.	17235.0	42.4	-	39.7	-2.4	31.9	-	47.9	-	68.2	-	20.3	-	Floor noise

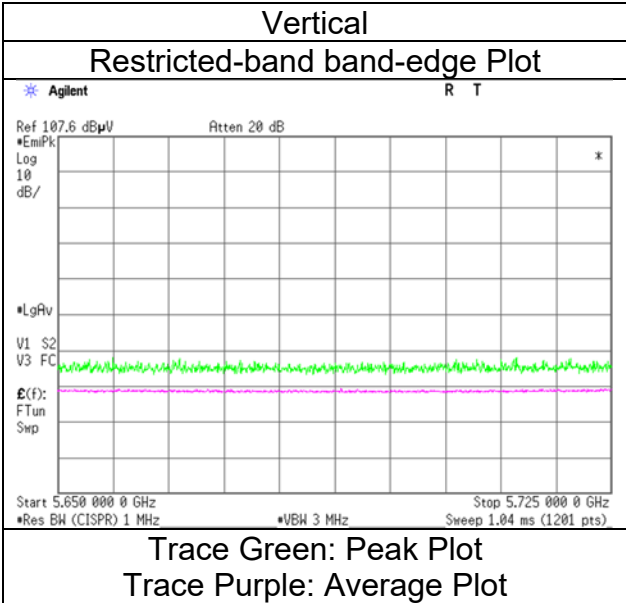
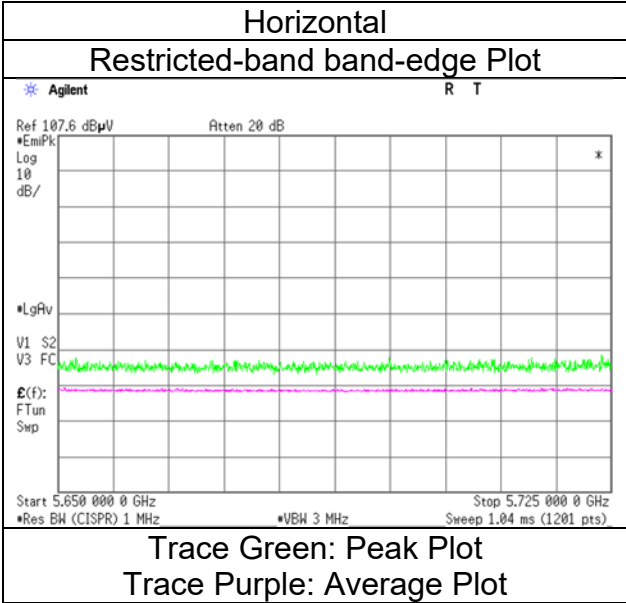
Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)
Result (AV)= Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).
*QP detector was used up to 1GHz.

Distance factor: 1 GHz - 6 GHz 20log (3.8 m / 3.0 m) = 2.06 dB
 6 GHz - 10 GHz 20log (4.8 m / 3.0 m) = 4.09 dB
 10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place
Semi Anechoic Chamber
Date
Temperature / Humidity
Engineer
Mode

Ise EMC Lab.
No.3
June 20, 2024
22 deg. C / 58 % RH
Hiroki Numata
Tx 11ac-20 5745 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	June 20, 2024	June 20, 2024	June 21, 2024
Temperature / Humidity	22 deg. C / 58 % RH	22 deg. C / 58 % RH	23 deg. C / 60 % RH
Engineer	Hiroki Numata	Yuta Moriya	Hiroki Numata
	(1 GHz to 6 GHz)	(6 GHz to 18 GHz)	(Above 18 GHz)
Mode	Tx 11ac-20 5785 MHz		

Polarity	Frequency	Reading	Reading	Ant.	Loss	Gain	Duty	Result	Result	Limit	Limit	Margin	Margin	Remark
[Hori/Vert]	[MHz]	(QP / PK)	(AV)	Factor	[dB]	[dB]	[dB]	(QP / PK)	(AV)	(QP / PK)	(AV)	(QP / PK)	(AV)	
		[dBuV]	[dBuV]	[dB/m]				[dBuV/m]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dB]	[dB]	
Hori.	3509.1	52.8	-	28.8	5.0	31.7	-	54.9	-	68.2	-	13.3	-	
Hori.	11570.0	43.3	34.6	37.5	-3.6	32.8	-	44.5	35.7	73.9	53.9	29.4	18.2	
Hori.	17355.0	42.5	-	39.8	-2.3	31.9	-	48.1	-	68.2	-	20.1	-	Floor noise
Vert.	3509.1	54.4	-	28.8	5.0	31.7	-	56.4	-	68.2	-	11.8	-	
Vert.	11570.0	42.9	34.2	37.5	-3.6	32.8	-	44.1	35.4	73.9	53.9	29.8	18.6	
Vert.	17355.0	42.6	-	39.8	-2.3	31.9	-	48.2	-	68.2	-	20.0	-	Floor noise

Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)
Result (AV)= Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).
*QP detector was used up to 1GHz.

Distance factor: 1 GHz - 6 GHz 20log (3.8 m / 3.0 m) = 2.06 dB
 6 GHz - 10 GHz 20log (4.8 m / 3.0 m) = 4.09 dB
 10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	June 20, 2024	June 20, 2024	June 21, 2024
Temperature / Humidity	22 deg. C / 58 % RH	22 deg. C / 58 % RH	23 deg. C / 60 % RH
Engineer	Hiroki Numata	Yuta Moriya	Hiroki Numata
	(1 GHz to 6 GHz)	(6 GHz to 18 GHz)	(Above 18 GHz)
Mode	Tx 11ac-20 5825 MHz		

Polarity	Frequency	Reading	Reading	Ant.	Loss	Gain	Duty	Result	Result	Limit	Limit	Margin	Margin	Remark
[Hori/Vert]	[MHz]	(QP / PK)	(AV)	Factor	[dB]	[dB]	[dB]	(QP / PK)	(AV)	(QP / PK)	(AV)	(QP / PK)	(AV)	
		[dBuV]	[dBuV]	[dB/m]				[dBuV/m]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dB]	[dB]	
Hori.	3509.1	53.0	-	28.8	5.0	31.7	-	55.0	-	68.2	-	13.2	-	
Hori.	5850.0	44.4	-	32.2	5.9	31.2	-	51.4	-	122.2	-	70.9	-	
Hori.	5855.0	42.1	-	32.2	5.9	31.2	-	49.0	-	110.8	-	61.8	-	
Hori.	5875.0	40.8	-	32.2	5.9	31.2	-	47.8	-	105.2	-	57.4	-	
Hori.	5925.0	40.6	-	32.3	5.9	31.2	-	47.6	-	68.2	-	20.6	-	
Hori.	11650.0	44.2	35.3	37.6	-3.6	32.7	-	45.5	36.6	73.9	53.9	28.5	17.4	
Hori.	17475.0	42.7	-	39.9	-2.3	31.9	-	48.4	-	68.2	-	19.8	-	Floor noise
Vert.	3509.1	54.1	-	28.8	5.0	31.7	-	56.1	-	68.2	-	12.1	-	
Vert.	5850.0	43.1	-	32.2	5.9	31.2	-	50.1	-	122.2	-	72.2	-	
Vert.	5855.0	41.5	-	32.2	5.9	31.2	-	48.4	-	110.8	-	62.4	-	
Vert.	5875.0	40.6	-	32.2	5.9	31.2	-	47.5	-	105.2	-	57.7	-	
Vert.	5925.0	40.1	-	32.3	5.9	31.2	-	47.1	-	68.2	-	21.1	-	
Vert.	11650.0	45.0	35.6	37.6	-3.6	32.7	-	46.3	36.8	73.9	53.9	27.6	17.1	
Vert.	17475.0	42.7	-	39.9	-2.3	31.9	-	48.4	-	68.2	-	19.8	-	Floor noise

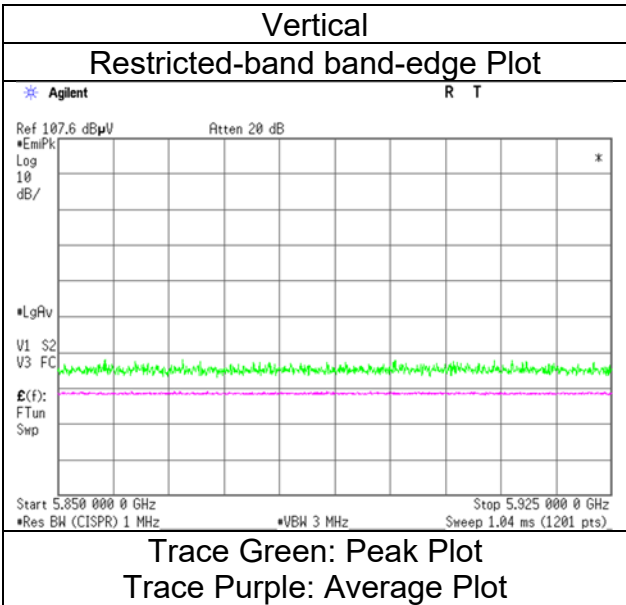
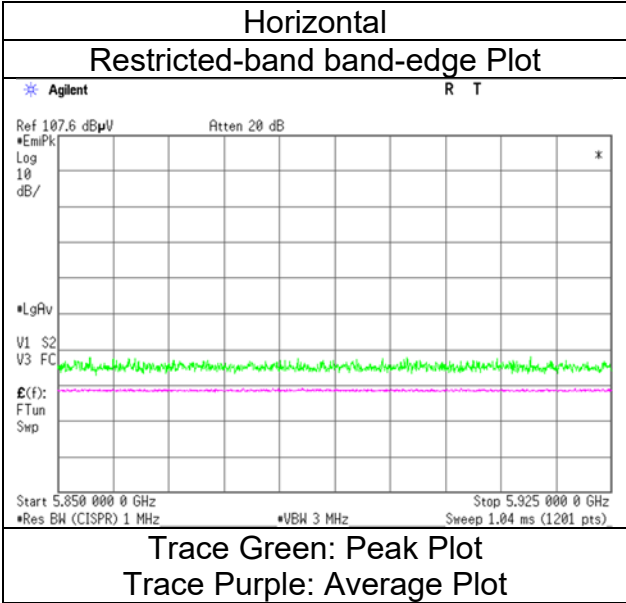
Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)
Result (AV)= Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).
*QP detector was used up to 1GHz.

Distance factor: 1 GHz - 6 GHz 20log (3.8 m / 3.0 m) = 2.06 dB
 6 GHz - 10 GHz 20log (4.8 m / 3.0 m) = 4.09 dB
 10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place
Semi Anechoic Chamber
Date
Temperature / Humidity
Engineer
Mode

Ise EMC Lab.
No.3
June 20, 2024
22 deg. C / 58 % RH
Hiroki Numata
Tx 11ac-20 5825 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Test place
Semi Anechoic Chamber
Date
Temperature / Humidity
Engineer
Mode

Ise EMC Lab.
No.3
June 20, 2024
22 deg. C / 58 % RH
Yuta Moriya
(1 GHz to 10 GHz)
Tx 11ac-40 5190 MHz

No.3
June 21, 2024
23 deg. C / 60 % RH
Hiroki Numata
(Above 10 GHz)

Polarity	Frequency	Reading	Reading	Ant.	Loss	Gain	Duty	Result	Result	Limit	Limit	Margin	Margin	Remark
[Hori/Vert]	[MHz]	(QP / PK)	(AV)	Factor	[dB]	[dB]	[dB]	(QP / PK)	(AV)	(QP / PK)	(AV)	(QP / PK)	(AV)	
		[dBuV]	[dBuV]	[dB/m]				[dBuV/m]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dB]	[dB]	
Hori.	3509.1	53.0	-	28.8	5.0	31.7	-	55.0	-	68.2	-	13.2	-	
Hori.	5150.0	52.8	33.2	31.8	5.6	31.1	-	59.1	39.5	73.9	53.9	14.8	14.4	
Hori.	10380.0	44.0	-	35.9	-3.9	32.9	-	43.1	-	68.2	-	25.1	-	
Hori.	15570.0	43.5	32.9	39.3	-2.8	32.0	-	48.0	37.4	73.9	53.9	25.9	16.5	Floor noise
Vert.	3509.1	54.0	-	28.8	5.0	31.7	-	56.0	-	68.2	-	12.2	-	
Vert.	5150.0	45.2	30.6	31.8	5.6	31.1	-	51.5	36.9	73.9	53.9	22.4	17.0	
Vert.	10380.0	43.4	-	35.9	-3.9	32.9	-	42.5	-	68.2	-	25.7	-	
Vert.	15570.0	43.1	32.9	39.3	-2.8	32.0	-	47.6	37.4	73.9	53.9	26.3	16.5	Floor noise

Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)
Result (AV)= Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).
*QP detector was used up to 1GHz.

Distance factor:

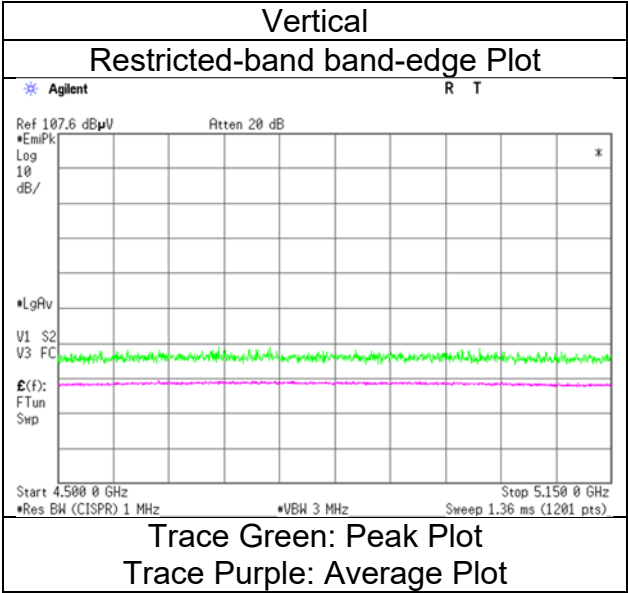
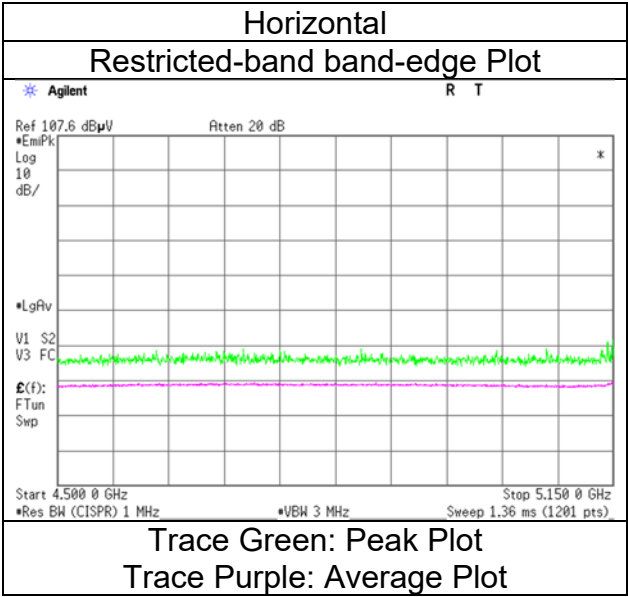
1 GHz - 6 GHz	20log (3.8 m / 3.0 m) = 2.06 dB
6 GHz - 10 GHz	20log (4.8 m / 3.0 m) = 4.09 dB
10 GHz - 40 GHz	20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place
Semi Anechoic Chamber
Date
Temperature / Humidity
Engineer

Mode

Ise EMC Lab.
No.3
June 20, 2024
22 deg. C / 58 % RH
Yuta Moriya
(1 GHz to 10 GHz)
Tx 11ac-40 5190 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Test place
Semi Anechoic Chamber
Date
Temperature / Humidity
Engineer
Mode

Ise EMC Lab.
No.3
June 20, 2024
22 deg. C / 58 % RH
Yuta Moriya
(1 GHz to 10 GHz)
Tx 11ac-40 5230 MHz

No.3
June 21, 2024
23 deg. C / 60 % RH
Hiroki Numata
(Above 10 GHz)

Polarity	Frequency	Reading	Reading	Ant.	Loss	Gain	Duty	Result	Result	Limit	Limit	Margin	Margin	Remark
[Hori/Vert]	[MHz]	(QP / PK)	(AV)	Factor	[dB]	[dB]	[dB]	(QP / PK)	(AV)	(QP / PK)	(AV)	(QP / PK)	(AV)	
		[dBuV]	[dBuV]	[dB/m]				[dBuV/m]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dB]	[dB]	
Hori.	3509.1	53.0	-	28.8	5.0	31.7	-	55.0	-	68.2	-	13.2	-	
Hori.	5350.0	40.8	29.7	31.6	5.7	31.1	-	47.0	35.8	73.9	53.9	26.9	18.1	
Hori.	10460.0	43.7	-	35.9	-3.9	32.9	-	42.8	-	68.2	-	25.4	-	
Hori.	15690.0	43.3	32.7	39.5	-2.8	32.0	-	48.0	37.4	73.9	53.9	25.9	16.5	Floor noise
Vert.	3509.1	53.6	-	28.8	5.0	31.7	-	55.7	-	68.2	-	12.6	-	
Vert.	5350.0	40.6	29.7	31.6	5.7	31.1	-	46.8	35.8	73.9	53.9	27.1	18.1	
Vert.	10460.0	42.5	-	35.9	-3.9	32.9	-	41.6	-	68.2	-	26.6	-	
Vert.	15690.0	42.2	32.8	39.5	-2.8	32.0	-	46.9	37.5	73.9	53.9	27.0	16.5	Floor noise

Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)
Result (AV)= Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).
*QP detector was used up to 1GHz.

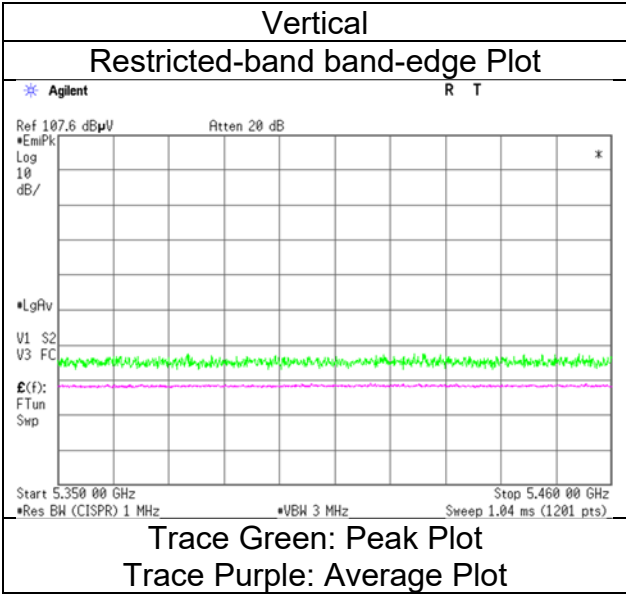
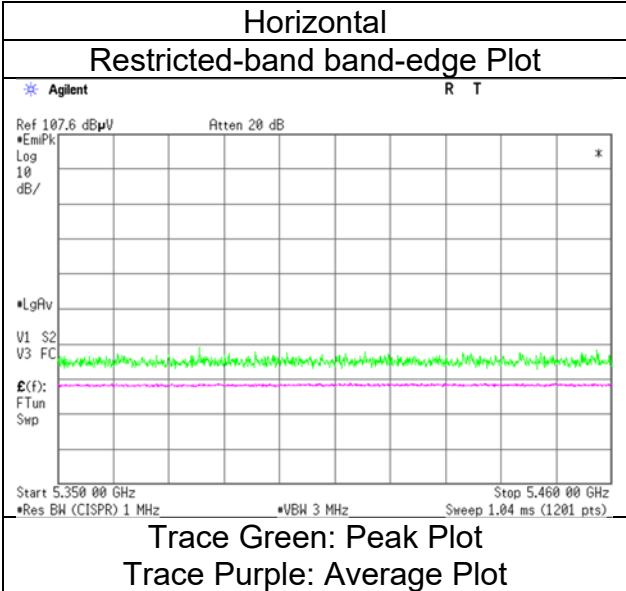
Distance factor:

1 GHz - 6 GHz	20log (3.8 m / 3.0 m) = 2.06 dB
6 GHz - 10 GHz	20log (4.8 m / 3.0 m) = 4.09 dB
10 GHz - 40 GHz	20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place
Semi Anechoic Chamber
Date
Temperature / Humidity
Engineer
Mode

Ise EMC Lab.
No.3
June 20, 2024
22 deg. C / 58 % RH
Yuta Moriya
Tx 11ac-40 5230 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Test place
Semi Anechoic Chamber
Date
Temperature / Humidity
Engineer
Mode

Ise EMC Lab.
No.3
June 20, 2024
22 deg. C / 58 % RH
Yuta Moriya
(1 GHz to 10 GHz)
Tx 11ac-40 5755 MHz

No.3
June 21, 2024
23 deg. C / 60 % RH
Hiroki Numata
(Above 10 GHz)

Polarity	Frequency	Reading (QP / PK)	Reading (AV)	Ant. Factor	Loss	Gain	Duty Factor	Result (QP / PK)	Result (AV)	Limit (QP / PK)	Limit (AV)	Margin (QP / PK)	Margin (AV)	Remark
[Hori/Vert]	[MHz]	[dBuV]	[dBuV]	[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dB]	[dB]	
Hori.	3509.1	53.0	-	28.8	5.0	31.7	-	55.0	-	68.2	-	13.2	-	
Hori.	5650.0	40.5	-	31.7	5.8	31.2	-	46.9	-	68.2	-	21.3	-	
Hori.	5700.0	40.8	-	31.8	5.8	31.2	-	47.3	-	105.2	-	57.9	-	
Hori.	5720.0	46.8	-	31.9	5.8	31.2	-	53.4	-	110.8	-	57.5	-	
Hori.	5725.0	48.8	-	31.9	5.8	31.2	-	55.4	-	122.2	-	66.8	-	
Hori.	11510.0	43.8	34.6	37.5	-3.6	32.8	-	44.9	35.8	73.9	53.9	29.0	18.2	
Hori.	17265.0	42.7	-	39.7	-2.4	31.9	-	48.2	-	68.2	-	20.0	-	Floor noise
Vert.	3509.1	53.7	-	28.8	5.0	31.7	-	55.7	-	68.2	-	12.5	-	
Vert.	5650.0	40.3	-	31.7	5.8	31.2	-	46.7	-	68.2	-	21.6	-	
Vert.	5700.0	40.5	-	31.8	5.8	31.2	-	47.0	-	105.2	-	58.2	-	
Vert.	5720.0	46.6	-	31.9	5.8	31.2	-	53.2	-	110.8	-	57.6	-	
Vert.	5725.0	47.8	-	31.9	5.8	31.2	-	54.4	-	122.2	-	67.8	-	
Vert.	11510.0	43.5	34.3	37.5	-3.6	32.8	-	44.6	35.5	73.9	53.9	29.3	18.5	
Vert.	17265.0	42.5	-	39.7	-2.4	31.9	-	48.0	-	68.2	-	20.2	-	Floor noise

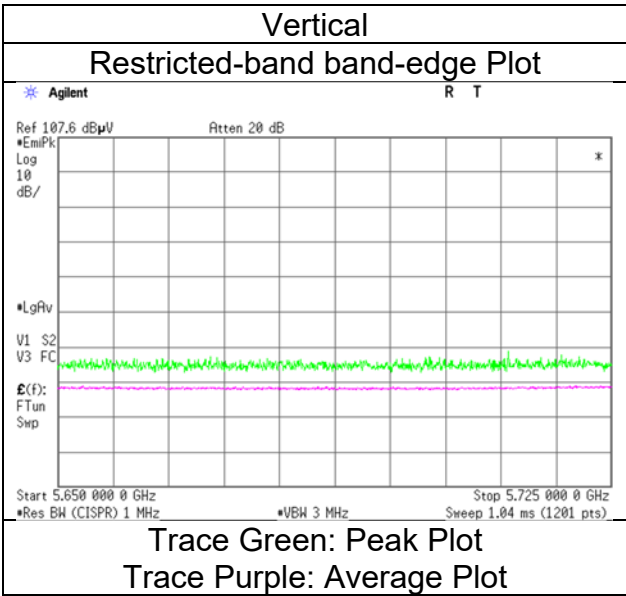
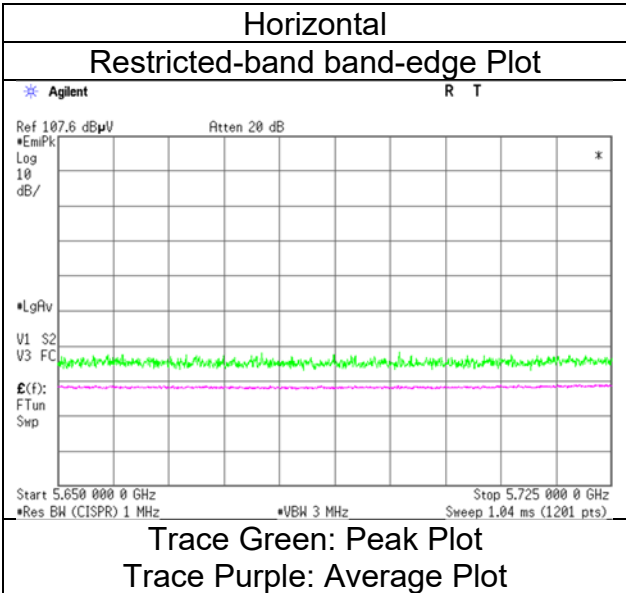
Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)
Result (AV)= Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).
*QP detector was used up to 1GHz.

Distance factor: 1 GHz - 6 GHz 20log (3.8 m / 3.0 m) = 2.06 dB
 6 GHz - 10 GHz 20log (4.8 m / 3.0 m) = 4.09 dB
 10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place
Semi Anechoic Chamber
Date
Temperature / Humidity
Engineer
Mode

Ise EMC Lab.
No.3
June 20, 2024
22 deg. C / 58 % RH
Yuta Moriya
Tx 11ac-40 5755 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Test place	Ise EMC Lab.	No.3
Semi Anechoic Chamber	No.3	No.3
Date	June 20, 2024	June 21, 2024
Temperature / Humidity	22 deg. C / 58 % RH	23 deg. C / 60 % RH
Engineer	Yuta Moriya	Hiroki Numata
	(1 GHz to 10 GHz)	(Above 10 GHz)
Mode	Tx 11ac-40 5795 MHz	

Polarity	Frequency	Reading	Reading	Ant.	Loss	Gain	Duty	Result	Result	Limit	Limit	Margin	Margin	Remark
[Hori/Vert]	[MHz]	(QP / PK)	(AV)	Factor	[dB]	[dB]	Factor	(QP / PK)	(AV)	(QP / PK)	(AV)	(QP / PK)	(AV)	
		[dBuV]	[dBuV]	[dB/m]			[dB]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dB]	[dB]	
Hori.	3509.1	53.0	-	28.8	5.0	31.7	-	55.0	-	68.2	-	13.2	-	
Hori.	5850.0	40.4	-	32.2	5.9	31.2	-	47.3	-	122.2	-	74.9	-	
Hori.	5855.0	40.3	-	32.2	5.9	31.2	-	47.2	-	110.8	-	63.6	-	
Hori.	5875.0	40.1	-	32.2	5.9	31.2	-	47.1	-	105.2	-	58.1	-	
Hori.	5925.0	40.1	-	32.3	5.9	31.2	-	47.1	-	68.2	-	21.1	-	
Hori.	11590.0	43.8	35.5	37.5	-3.6	32.8	-	45.0	36.6	73.9	53.9	28.9	17.3	
Hori.	17385.0	42.8	-	39.8	-2.3	31.9	-	48.4	-	68.2	-	19.8	-	Floor noise
Vert.	3509.1	53.8	-	28.8	5.0	31.7	-	55.8	-	68.2	-	12.4	-	
Vert.	5850.0	41.1	-	32.2	5.9	31.2	-	48.1	-	122.2	-	74.1	-	
Vert.	5855.0	40.8	-	32.2	5.9	31.2	-	47.7	-	110.8	-	63.1	-	
Vert.	5875.0	40.5	-	32.2	5.9	31.2	-	47.5	-	105.2	-	57.7	-	
Vert.	5925.0	40.4	-	32.3	5.9	31.2	-	47.4	-	68.2	-	20.8	-	
Vert.	11590.0	42.6	34.7	37.5	-3.6	32.8	-	43.7	35.8	73.9	53.9	30.2	18.1	
Vert.	17385.0	42.8	-	39.8	-2.3	31.9	-	48.4	-	68.2	-	19.8	-	Floor noise

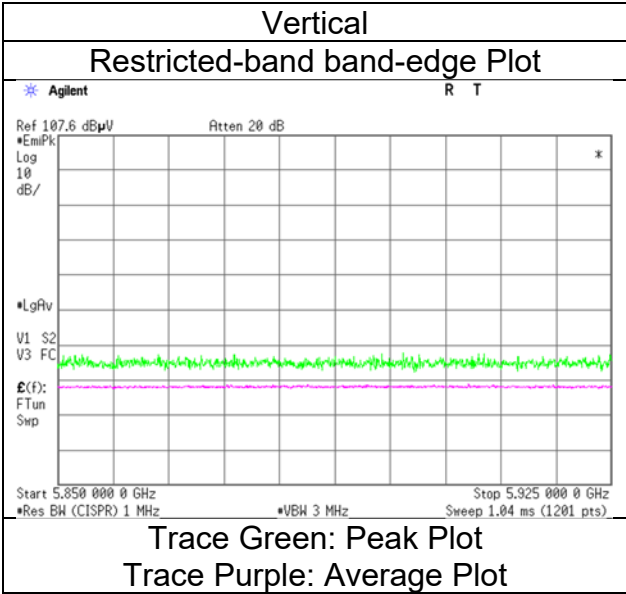
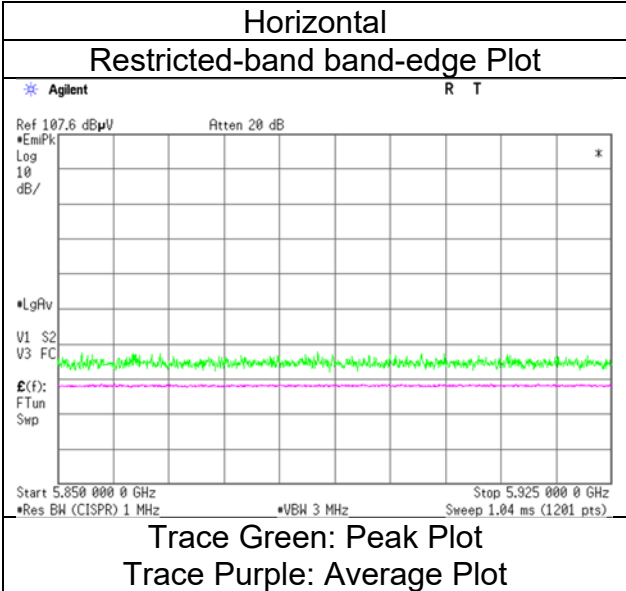
Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)
Result (AV)= Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).
*QP detector was used up to 1GHz.

Distance factor: 1 GHz - 6 GHz 20log (3.8 m / 3.0 m) = 2.06 dB
 6 GHz - 10 GHz 20log (4.8 m / 3.0 m) = 4.09 dB
 10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place
Semi Anechoic Chamber
Date
Temperature / Humidity
Engineer
Mode

Ise EMC Lab.
No.3
June 20, 2024
22 deg. C / 58 % RH
Yuta Moriya
Tx 11ac-40 5795 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Test place	Ise EMC Lab.	No.3
Semi Anechoic Chamber	No.3	No.3
Date	June 20, 2024	June 21, 2024
Temperature / Humidity	22 deg. C / 58 % RH	23 deg. C / 60 % RH
Engineer	Yuta Moriya	Hiroki Numata
	(1 GHz to 10 GHz)	(Above 10 GHz)
Mode	Tx 11ac-80 5210 MHz	

Polarity	Frequency	Reading	Reading	Ant.	Loss	Gain	Duty	Result	Result	Limit	Limit	Margin	Margin	Remark
[Hori/Vert]	[MHz]	(QP / PK)	(AV)	Factor	[dB]	[dB]	[dB]	(QP / PK)	(AV)	(QP / PK)	(AV)	(QP / PK)	(AV)	
[dBuV]	[dBuV]	[dB/m]	[dB]	[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dB]	[dB]	
Hori.	3509.1	53.0	-	28.8	5.0	31.7	-	55.0	-	68.2	-	13.2	-	
Hori.	5150.0	44.7	34.2	31.8	5.6	31.1	-	51.0	40.6	73.9	53.9	22.9	13.4	
Hori.	5350.0	47.9	31.4	31.6	5.7	31.1	-	54.0	37.5	73.9	53.9	19.9	16.4	
Hori.	10420.0	42.9	-	35.9	-3.9	32.9	-	42.0	-	68.2	-	26.2	-	
Hori.	15630.0	42.6	32.9	39.4	-2.8	32.0	-	47.2	37.5	73.9	53.9	26.7	16.4	Floor noise
Vert.	3509.1	54.0	-	28.8	5.0	31.7	-	56.0	-	68.2	-	12.2	-	
Vert.	5150.0	41.9	32.4	31.8	5.6	31.1	-	48.2	38.7	73.9	53.9	25.7	15.2	
Vert.	5350.0	40.4	31.1	31.6	5.7	31.1	-	46.5	37.2	73.9	53.9	27.4	16.7	
Vert.	10420.0	43.3	-	35.9	-3.9	32.9	-	42.5	-	68.2	-	25.7	-	
Vert.	15630.0	42.5	32.9	39.4	-2.8	32.0	-	47.1	37.5	73.9	53.9	26.8	16.4	Floor noise

Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

Result (AV)= Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

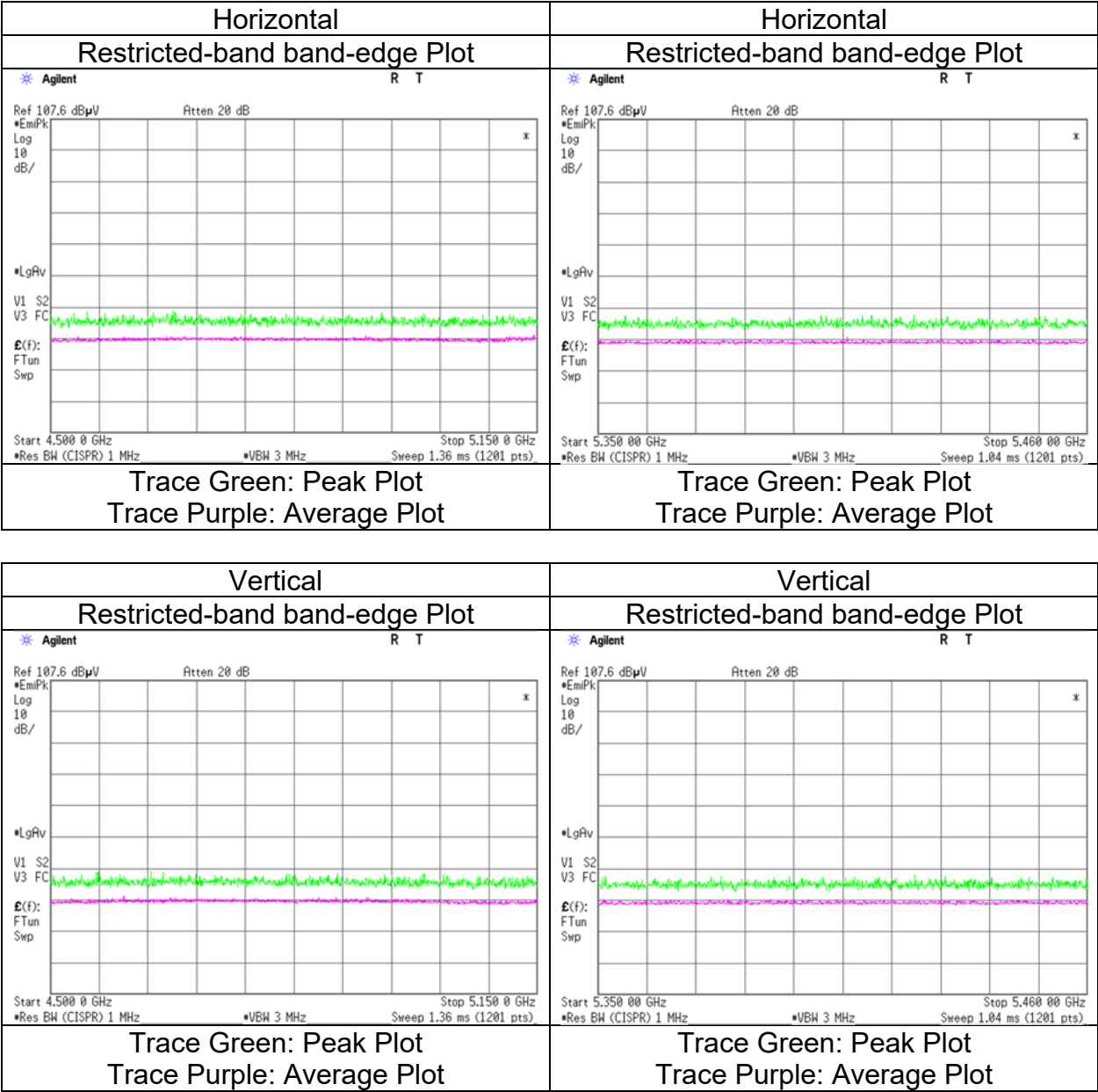
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

*QP detector was used up to 1GHz.

Distance factor:	1 GHz - 6 GHz	20log (3.8 m / 3.0 m) = 2.06 dB
	6 GHz - 10 GHz	20log (4.8 m / 3.0 m) = 4.09 dB
	10 GHz - 40 GHz	20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	June 20, 2024
Temperature / Humidity	22 deg. C / 58 % RH
Engineer	Yuta Moriya
Mode	Tx 11ac-80 5210 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Test place	Ise EMC Lab.	
Semi Anechoic Chamber	No.3	No.3
Date	June 20, 2024	June 21, 2024
Temperature / Humidity	22 deg. C / 58 % RH	23 deg. C / 60 % RH
Engineer	Yuta Moriya (1 GHz to 10 GHz)	Hiroki Numata (Above 10 GHz)
Mode	Tx 11ac-80 5775 MHz	

Polarity	Frequency	Reading (QP / PK)	Reading (AV)	Ant. Factor	Loss	Gain	Duty Factor	Result (QP / PK)	Result (AV)	Limit (QP / PK)	Limit (AV)	Margin (QP / PK)	Margin (AV)	Remark
[Hori/Vert]	[MHz]	[dBuV]	[dBuV]	[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dB]	[dB]	
Hori.	3509.1	53.0	-	28.8	5.0	31.7	-	55.0	-	68.2	-	13.2	-	
Hori.	5650.0	40.1	-	31.7	5.8	31.2	-	46.5	-	68.2	-	21.7	-	
Hori.	5700.0	40.4	-	31.8	5.8	31.2	-	46.9	-	105.2	-	58.3	-	
Hori.	5720.0	40.6	-	31.9	5.8	31.2	-	47.2	-	110.8	-	63.6	-	
Hori.	5725.0	40.9	-	31.9	5.8	31.2	-	47.4	-	122.2	-	74.8	-	
Hori.	5850.0	40.4	-	32.2	5.9	31.2	-	47.3	-	122.2	-	74.9	-	
Hori.	5855.0	40.3	-	32.2	5.9	31.2	-	47.2	-	110.8	-	63.6	-	
Hori.	5875.0	40.1	-	32.2	5.9	31.2	-	47.1	-	105.2	-	58.1	-	
Hori.	5925.0	40.0	-	32.3	5.9	31.2	-	47.1	-	68.2	-	21.1	-	
Hori.	11550.0	42.4	36.4	37.5	-3.6	32.8	-	43.5	37.5	73.9	53.9	30.4	16.4	
Hori.	17325.0	43.3	-	39.8	-2.3	31.9	-	48.9	-	68.2	-	19.4	-	Floor noise
Vert.	3509.1	53.9	-	28.8	5.0	31.7	-	55.9	-	68.2	-	12.3	-	
Vert.	5650.0	40.0	-	31.7	5.8	31.2	-	46.4	-	68.2	-	21.8	-	
Vert.	5700.0	40.5	-	31.8	5.8	31.2	-	47.0	-	105.2	-	58.2	-	
Vert.	5720.0	40.9	-	31.9	5.8	31.2	-	47.5	-	110.8	-	63.3	-	
Vert.	5725.0	41.1	-	31.9	5.8	31.2	-	47.7	-	122.2	-	74.5	-	
Vert.	5850.0	40.6	-	32.2	5.9	31.2	-	47.5	-	122.2	-	74.7	-	
Vert.	5855.0	40.4	-	32.2	5.9	31.2	-	47.3	-	110.8	-	63.5	-	
Vert.	5875.0	40.1	-	32.2	5.9	31.2	-	47.1	-	105.2	-	58.1	-	
Vert.	5925.0	40.0	-	32.3	5.9	31.2	-	47.0	-	68.2	-	21.2	-	
Vert.	11550.0	43.3	36.2	37.5	-3.6	32.8	-	44.5	37.4	73.9	53.9	29.4	16.5	
Vert.	17325.0	43.2	-	39.8	-2.3	31.9	-	48.8	-	68.2	-	19.4	-	Floor noise

Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

$$\text{Result (AV)} = \text{Reading} + \text{Ant Factor} + \text{Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz))} - \text{Gain(Amplifier)} + \text{Duty factor}$$

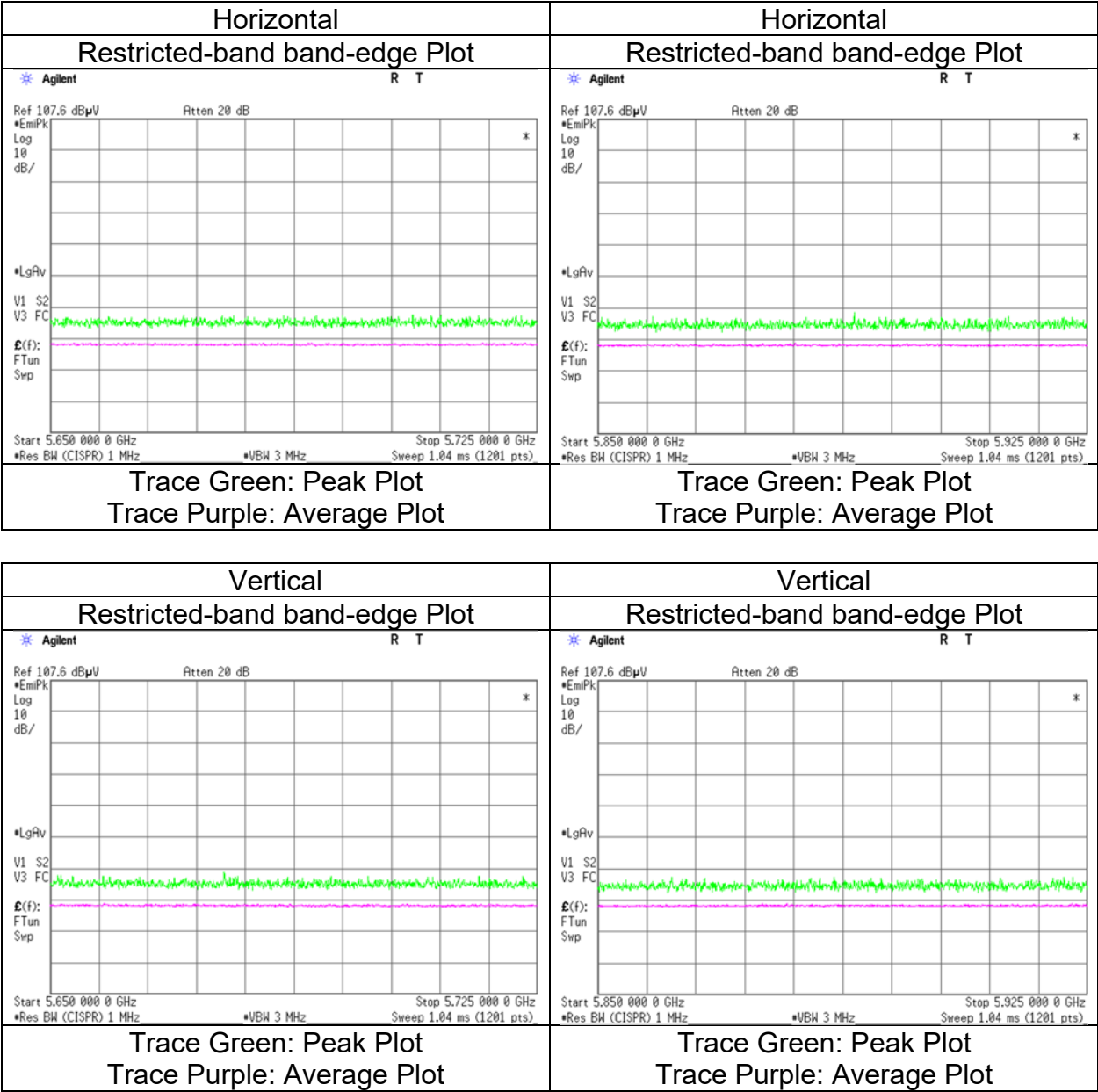
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

*QP detector was used up to 1GHz.

Distance factor:	1 GHz - 6 GHz	$20\log(3.8 \text{ m} / 3.0 \text{ m}) = 2.06 \text{ dB}$
	6 GHz - 10 GHz	$20\log(4.8 \text{ m} / 3.0 \text{ m}) = 4.09 \text{ dB}$
	10 GHz - 40 GHz	$20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.5 \text{ dB}$

Radiated Spurious Emission

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	June 20, 2024
Temperature / Humidity	22 deg. C / 58 % RH
Engineer	Yuta Moriya
Mode	Tx 11ac-80 5775 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Test place
Semi Anechoic Chamber
Date
Temperature / Humidity
Engineer
Mode

Ise EMC Lab.
No.3
June 23, 2024
23 deg. C / 60 % RH
Junya Okuno
(Above 1 GHz)
Tx 11ac-20 5220 MHz + BT

No.3
June 23, 2024
22 deg. C / 59 % RH
Hiroki Numata
(Below 1 GHz)
3DH5 Hopping On

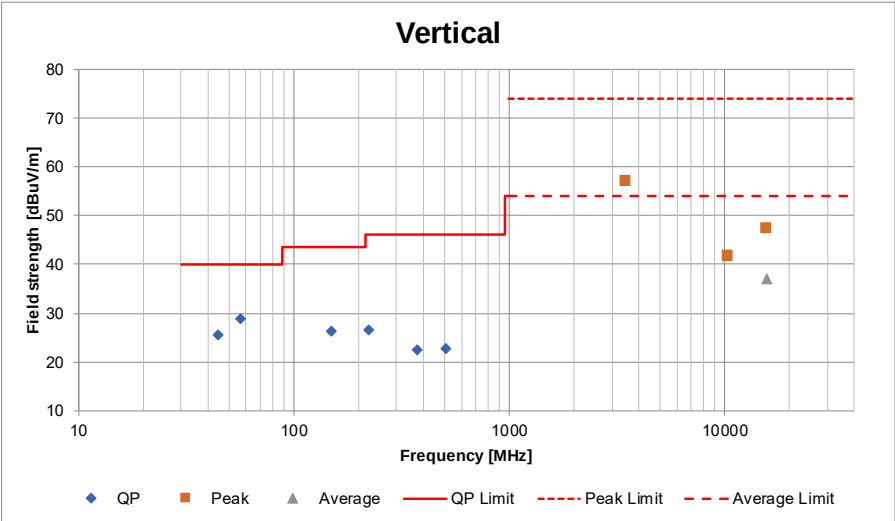
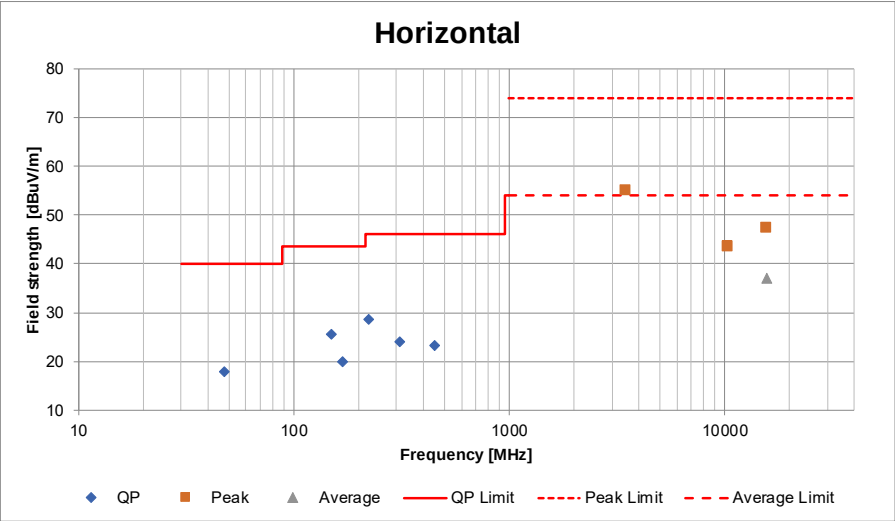
Polarity	Frequency	Reading	Reading	Ant.	Loss	Gain	Duty	Result	Result	Limit	Limit	Margin	Margin	Remark
[Hori/Vert]	[MHz]	(QP / PK) [dBuV]	(AV) [dBuV]	Factor [dB/m]	[dB]	[dB]	[dB]	(QP / PK) [dBuV/m]	(AV) [dBuV/m]	(QP / PK) [dBuV/m]	(AV) [dBuV/m]	(QP / PK) [dB]	(AV) [dB]	
Hori.	47.4	30.7	-	12.1	7.2	32.2	-	17.8	-	40.0	-	22.2	-	
Hori.	148.6	34.5	-	14.8	8.4	32.1	-	25.6	-	43.5	-	17.9	-	
Hori.	168.7	27.5	-	15.8	8.6	32.1	-	19.8	-	43.5	-	23.7	-	
Hori.	221.2	40.5	-	11.3	9.0	32.0	-	28.7	-	46.0	-	17.3	-	
Hori.	310.6	32.4	-	13.7	9.7	32.0	-	23.8	-	46.0	-	22.2	-	
Hori.	449.8	28.0	-	16.5	10.6	32.0	-	23.1	-	46.0	-	22.9	-	
Hori.	3509.1	50.0	-	28.8	7.1	31.7	-	54.2	-	68.2	-	14.0	-	
Hori.	10440.0	43.9	-	35.9	-3.9	32.9	-	43.1	-	68.2	-	25.1	-	
Hori.	15660.0	42.7	32.7	39.4	-2.8	32.0	-	47.4	37.4	73.9	53.9	26.5	16.5	Floor noise
Vert.	44.2	37.6	-	13.3	7.1	32.2	-	25.8	-	40.0	-	14.2	-	
Vert.	56.7	44.6	-	9.0	7.3	32.2	-	28.7	-	40.0	-	11.3	-	
Vert.	148.6	35.3	-	14.8	8.4	32.1	-	26.4	-	43.5	-	17.1	-	
Vert.	221.2	38.2	-	11.3	9.0	32.0	-	26.4	-	46.0	-	19.6	-	
Vert.	371.8	29.2	-	15.0	10.1	32.0	-	22.3	-	46.0	-	23.7	-	
Vert.	504.3	26.0	-	17.8	10.9	32.0	-	22.7	-	46.0	-	23.3	-	
Vert.	3509.1	51.9	-	28.8	7.1	31.7	-	56.1	-	68.2	-	12.1	-	
Vert.	10440.0	43.9	-	35.9	-3.9	32.9	-	43.0	-	68.2	-	25.2	-	
Vert.	15660.0	42.7	32.7	39.4	-2.8	32.0	-	47.4	37.3	73.9	53.9	26.6	16.6	Floor noise

Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)
Result (AV)= Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).
*QP detector was used up to 1GHz.

Distance factor: 1 GHz - 6 GHz 20log (3.8 m / 3.0 m) = 2.06 dB
 6 GHz - 10 GHz 20log (4.8 m / 3.0 m) = 4.09 dB
 10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

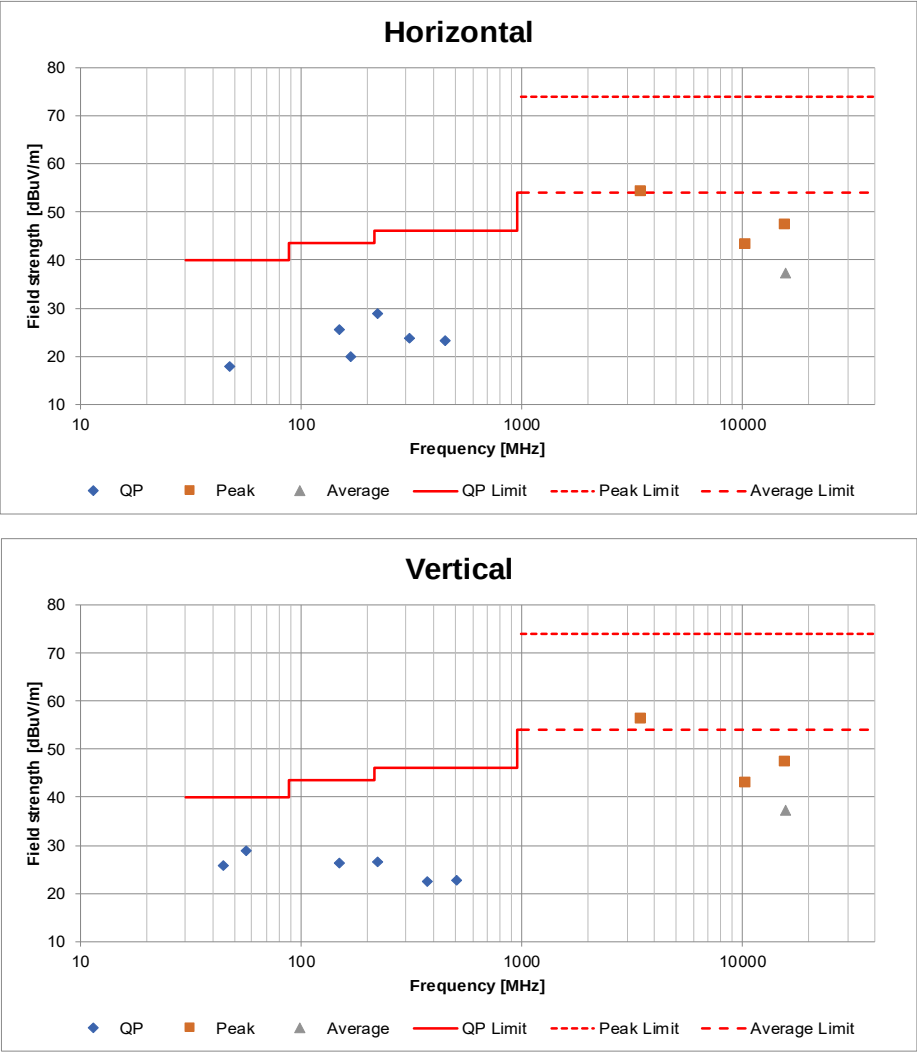
Radiated Spurious Emission
(Plot data, Worst case mode for Maximum Conducted Output Power)

Test place	Ise EMC Lab.			
Semi Anechoic Chamber	No.3	No.3	No.3	No.3
Date	June 20, 2024	June 20, 2024	June 21, 2024	June 23, 2024
Temperature / Humidity	22 deg. C / 58 % RH	22 deg. C / 58 % RH	23 deg. C / 60 % RH	22 deg. C / 59 % RH
Engineer	Hiroki Numata (1 GHz to 6 GHz)	Yuta Moriya (6 GHz to 18 GHz)	Hiroki Numata (Above 18 GHz)	Hiroki Numata (Below 1 GHz)
Mode	Tx 11ac-20 5220 MHz			



Radiated Spurious Emission
(Plot data)

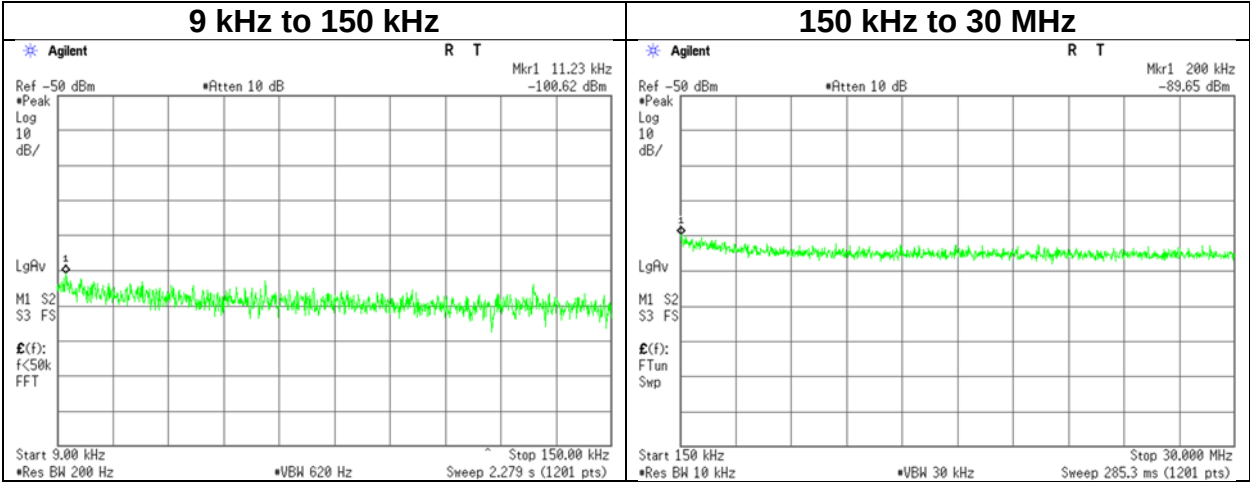
Test place	Ise EMC Lab.	No.3
Semi Anechoic Chamber	No.3	No.3
Date	June 23, 2024	June 23, 2024
Temperature / Humidity	23 deg. C / 60 % RH	22 deg. C / 59 % RH
Engineer	Junya Okuno (Above 1 GHz)	Hiroki Numata (Below 1 GHz)
Mode	Tx 11ac-20 5220 MHz + BT 3DH5 Hopping On	



Conducted Spurious Emission

Test place
Date
Temperature / Humidity
Engineer
Mode

Ise EMC Lab. No.5 Measurement Room
June 27, 2024
23 deg. C / 50 % RH
Shousei Hamaguchi
Tx 11ac-20 5220 MHz



Frequency	Reading	Cable Loss	Attenuator	Antenna Gain*	N (Number of Output)	EIRP	Distance	Ground bounce	E (field strength)	Limit	Margin	Remark
[kHz]	[dBm]	[dB]	[dB]	[dBi]		[dBm]	[m]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	
11.23	-100.6	1.91	9.7	2.0	2	-84.0	300	6.0	-22.8	46.5	69.3	
200.00	-89.7	2.17	9.7	2.0	2	-72.7	300	6.0	-11.5	21.5	33.0	

$E \text{ [dBuV/m]} = \text{EIRP [dBm]} - 20 \log (\text{Distance [m]}) + \text{Ground bounce [dB]} + 104.8 \text{ [dBuV/m]}$
 $\text{EIRP [dBm]} = \text{Reading [dBm]} + \text{Cable loss [dB]} + \text{Attenuator Loss [dB]} + \text{Antenna gain [dBi]} + 10 * \log (\text{N})$
N: Number of output
*2.0 dBi was applied to the test result based on KDB 789033 since antenna gain was less than 2.0 dBi.

APPENDIX 2: Test Instruments

Test Equipment-1/2

Test Item	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Cal Int
RE	141232	High Pass Filter 3.5-18.0GHz	UL Japan	HPF SELECTOR	001	09/04/2023	12
RE	141266	Logperiodic Antenna(200-1000MHz)	Schwarzbeck Mess-Elektronik OHG	VUSLP9111B	9111B-191	08/10/2023	12
RE	141323	Coaxial cable	UL Japan	-	-	09/10/2023	12
RE	141424	Biconical Antenna	Schwarzbeck Mess-Elektronik OHG	VHA9103+BBA9106	1915	03/15/2024	12
RE	141507	Horn Antenna 1-18GHz	Schwarzbeck Mess-Elektronik OHG	BBHA9120D	258	11/20/2023	12
RE	141513	Horn Antenna 15-40GHz	Schwarzbeck Mess-Elektronik OHG	BBHA9170	BBHA9170306	07/19/2023	12
RE	141517	Horn Antenna 26.5-40GHz	ETS-Lindgren	3160-10	152399	11/20/2023	12
RE	141532	DIGITAL HiTESTER	HIOKI E.E. CORPORATION	3805	051201197	01/31/2024	12
RE	141580	MicroWave System Amplifier	Keysight Technologies Inc	83017A	MY39500779	03/08/2024	12
RE	141582	Pre Amplifier	SONOMA INSTRUMENT	310	260834	02/17/2024	12
RE	141588	Pre Amplifier	L3 Narda-MITEQ	AMF-6F-2600400-33-8P / AMF-4F-2600400-33-8P	1871355 /1871328	01/22/2024	12
RE	141899	Spectrum Analyzer	Keysight Technologies Inc	E4448A	MY46180655	05/09/2024	12
RE	141901	Spectrum Analyzer	Keysight Technologies Inc	E4440A	MY48250080	01/26/2024	12
RE	142008	AC3_Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	12/11/2023	24
RE	142013	AC3_Semi Anechoic Chamber(SVSWR)	TDK	Semi Anechoic Chamber 3m	DA-10005	04/12/2023	24
RE	142183	Measure	KOMELON	KMC-36	-	10/20/2023	12
RE	142314	Attenuator	Pasternack Enterprises	PE7390-6	D/C 1504	06/06/2024	12
RE	144196	Test Receiver	Rohde & Schwarz	ESCI	100608	10/18/2023	12
RE	160324	Coaxial Cable	Huber+Suhner	SUCOFLEX 102A	MY009/2A	10/05/2023	12
RE	178648	EMI measurement program	TSJ (Techno Science Japan)	TEPTO-DV	-	-	-
RE	225532	High Pass Filter 8-24.5GHz	TSJ (Techno Science Japan)	SCHPF-8000/T4125-O/O	1504C	11/20/2023	12
RE	244709	Thermo-Hygrometer	HIOKI E.E. CORPORATION	LR5001	231202103	01/25/2024	12
RE	245787	Double Ridge Horn Antenna	Schwarzbeck Mess-Elektronik OHG	BBHA 9120 C	689	03/06/2024	12
RE	246001	Microwave Cable	Huber+Suhner	SF103/11PC35/11P C35/1000mm / SF126E/5000mm	800673(1m) / 610204(5m)	03/06/2024	12

Test Equipment-2/2

Test Item	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Cal Int
AT	141244	Attenuator(10dB)	Weinschel - API Technologies Corp	WA8-10-34	A198	02/17/2024	12
AT	141279	Microwave Cable	Junkosha	MMX221-00500DMSDMS	1502S303	03/04/2024	12
AT	141327	Coaxial Cable	UL Japan	-	-	02/09/2024	12
AT	141532	DIGITAL HiTESTER	HIOKI E.E. CORPORATION	3805	051201197	01/31/2024	12
AT	141545	DIGITAL HiTESTER	HIOKI E.E. CORPORATION	3805	51201148	02/01/2024	12
AT	141546	Digital HiTESTER	HIOKI E.E. CORPORATION	3805	060100600	05/17/2024	12
AT	141563	Thermo-Hygrometer	CUSTOM. Inc	CTH-180	1005	01/10/2024	12
AT	141809	Power Meter	Anritsu Corporation	ML2495A	825002	05/22/2024	12
AT	141830	Power sensor	Anritsu Corporation	MA2411B	738285	05/22/2024	12
AT	141899	Spectrum Analyzer	Keysight Technologies Inc	E4448A	MY46180655	05/09/2024	12
AT	141901	Spectrum Analyzer	Keysight Technologies Inc	E4440A	MY48250080	01/26/2024	12
AT	197219	Microwave cable	Huber+Suhner	SF126E/11PC35/11PC35/2000MM	536999/126E	03/19/2024	12
AT	244709	Thermo-Hygrometer	HIOKI E.E. CORPORATION	LR5001	231202103	01/25/2024	12
AT	244710	Thermo-Hygrometer	HIOKI E.E. CORPORATION	LR5001	231202104	01/25/2024	12
AT	248892	Attenuator	Weinschel Associates	WA56-10-1112	1	05/28/2024	12

*Hyphens for Last Calibration Date and Cal Int (month) are instruments that Calibration is not required (e.g. software), or instruments checked in advance before use.

The expiration date of the calibration is the end of the expired month.

As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibrations.

All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.

Test item:

AT: Antenna Terminal Conducted test

RE: Radiated Emission