
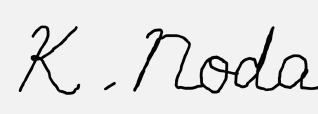




RADIO TEST REPORT

Test Report No. 14945010S-R1

Customer	JVCKENWOOD Corporation
Description of EUT	Monitor with Receiver
Model Number of EUT	DMX809S
FCC ID	IOMJ5284
Test Regulation	FCC Part 15 Subpart C
Test Result	Complied
Issue Date	September 1, 2023
Remarks	Bluetooth (BR / EDR) parts For Permissive Change Antenna terminal conducted test only

Representative Test Engineer	Approved By
	
Yosuke Murakami Engineer	Kazuya Noda Leader
 	
CERTIFICATE 1266.03	
<input type="checkbox"/> The testing in which "Non-accreditation" is displayed is outside the accreditation scopes in UL Japan, Inc.	
<input checked="" type="checkbox"/> There is no testing item of "Non-accreditation".	

Report Cover Page - Form-ULID-003532 (DCS:13-EM-F0429) Issue# 22.0

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- This test report covers Radio technical requirements.
It does not cover administrative issues such as Manual or non-Radio test related Requirements. (if applicable)
- The all test items in this test report are conducted by UL Japan, Inc. Shonan EMC Lab.
- The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan, Inc. has been accredited.
- The information provided from the customer for this report is identified in Section 1.
- For test report(s) referred in this report, the latest version (including any revisions) is always referred.

REVISION HISTORY

Original Test Report No.: 14945010S

Revision	Test Report No.	Date	Page Revised Contents
- (Original)	14945010S	August 28, 2023	-
1	14945010S-R1	September 1, 2023	Cover remarks: Addition of "For Permissive Change" Sec 2.1 Addition of test date "July 12" Sec 4.1 Correction of date of software From: 2023.07.03 To: 2022.07.22

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	JVCKENWOOD Corporation
Address	2967-3, Ishikawa-machi, Hachioji, Tokyo 192-8525 Japan
Telephone Number	+81-42-646-5525
Contact Person	Seigo Tsutsumi

The information provided from 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

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

SECTION 2: Equipment Under Test (EUT)

2.1 Identification of EUT

Description	Monitor with Receiver
Model Number	DMX809S
Serial Number	Refer to SECTION 4.2
Condition	Production model
Modification	No Modification by the test lab
Receipt Date	July 3, 2023
Test Date	July 12 to August 14, 2023

2.2 Product Description

General Specification

Rating	DC 12 V
Operating temperature	-10 deg. C to +60 deg. C

Radio Specification

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 Gain	-12.3 dBi

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

Equipment Type	Transceiver
Frequency of Operation	2412 MHz to 2462 MHz
Type of Modulation	DSSS, OFDM
Antenna Gain	-9.4 dBi

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

Equipment Type	Transceiver	
Frequency of Operation	20 MHz Band:	5745 MHz to 5805 MHz
	40 MHz Band:	5755 MHz to 5795 MHz
	80 MHz Band:	5775 MHz
Type of Modulation	OFDM	
Antenna Gain	ANT0: 1.1 dBi, ANT1: 0.1 dBi	

2.3 Variant model(s)

Model No.	Difference from the base model
DMX809S	- (Tested model)
DMX8709S	Non HD Radio
KW-M785BW	Brand(JVC), Non HD Radio

SECTION 3: Test Specification, Procedures & Results

3.1 Test Specification

Test Specification	FCC Part 15 Subpart C The latest version on the first day of the testing period
Title	FCC 47 CFR Part 15 Radio Frequency Device Subpart C Intentional Radiators Section 15.207 Conducted limits Section 15.247 Operation within the bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz

*The customer has declared that the EUT has complies with FCC Part 15 Subpart B as SDoC.

3.2 Procedures and Results

Item	Test Procedure	Specification	Worst Margin	Results	Remarks
Conducted Emission	FCC: ANSI C63.10-2013 6. Standard test methods	FCC: Section 15.207	-	N/A	*1)
	ISED: RSS-Gen 8.8	ISED: RSS-Gen 8.8			
Carrier Frequency Separation	FCC: KDB 558074 D01 15.247 Meas Guidance v05r02	FCC: Section15.247(a)(1)	See data.	Complied	Conducted
	ISED: -	ISED: RSS-247 5.1 (b)			
20dB Bandwidth	FCC: KDB 558074 D01 15.247 Meas Guidance v05r02	FCC: Section15.247(a)(1)		Complied	Conducted
	ISED: -	ISED: RSS-247 5.1 (a)			
Number of Hopping Frequency	FCC: KDB 558074 D01 15.247 Meas Guidance v05r02	FCC: Section15.247(a)(1)(iii)		Complied	Conducted
	ISED: -	ISED: RSS-247 5.1 (d)			
Dwell time	FCC: KDB 558074 D01 15.247 Meas Guidance v05r02	FCC: Section15.247(a)(1)(iii)		Complied	Conducted
	ISED: -	ISED: RSS-247 5.1 (d)			
Maximum Peak Output Power	FCC: KDB 558074 D01 15.247 Meas Guidance v05r02	FCC: Section15.247(b)(1)		Complied	Conducted
	ISED: RSS-Gen 6.12	ISED: RSS-247 5.4 (b)			
Spurious Emission & Band Edge Compliance	FCC: KDB 558074 D01 15.247 Meas Guidance v05r02	FCC: Section15.247(d)	-	Complied	Conducted
	ISED: RSS-Gen 6.13	ISED: RSS-247 5.5 RSS-Gen 8.9 RSS-Gen 8.10			

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 does not have AC Mains.

FCC Part 15.31 (e)

The 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. That does not affect the test result, therefore the EUT complies with the requirement.

FCC Part 15.203 Antenna requirement

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

3.3 Addition to Standard

Item	Test Procedure	Specification	Worst Margin	Results	Remarks
99% Occupied Bandwidth	ISED: RSS-Gen 6.7	ISED: -	N/A	-	Conducted

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

3.4 Uncertainty

Measurement uncertainty is not taken into account when stating conformity with a specified requirement.
Note: When margins obtained from test results are less than the measurement uncertainty, the test results may exceed the limit.

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

Item	Frequency range	Uncertainty (+/-)
Conducted Emission (AC Mains) LISN	150 kHz-30 MHz	3.1 dB
Radiated Emission (Measurement distance: 3 m)	9 kHz-30 MHz	3.3 dB
	30 MHz-200 MHz	4.8 dB
	200 MHz-1 GHz	6.1 dB
	1 GHz-6 GHz	4.7 dB
	6 GHz-18 GHz	5.3 dB
	18 GHz-40 GHz	5.5 dB
Radiated Emission (Measurement distance: 1 m)	1 GHz-18 GHz	5.6 dB
	18 GHz-40 GHz	5.8 dB

Antenna terminal test	Uncertainty (+/-)
Power Measurement above 1 GHz (Average Detector) SPM-06	1.3 dB
Power Measurement above 1 GHz (Peak Detector) SPM-06	2.1 dB
Power Measurement above 1 GHz (Average Detector) SPM-07	1.1 dB
Power Measurement above 1 GHz (Peak Detector) SPM-07	1.2 dB
Power Measurement above 1 GHz (Average Detector) SPM-13	1.1 dB
Power Measurement above 1 GHz (Peak Detector) SPM-13	1.4 dB
Spurious Emission (Conducted) below 1 GHz	0.84 dB
Conducted Emissions Power Density Measurement 1 GHz-3 GHz	0.86 dB
Conducted Emissions Power Density Measurement 3 GHz-18 GHz	2.4 dB
Spurious Emission (Conducted) 18 GHz-26.5 GHz	2.4 dB
Spurious Emission (Conducted) 26.5 GHz-40 GHz	2.2 dB
Bandwidth Measurement	0.012 %
Duty Cycle and Time Measurement	0.27 %
Temperature SCH-01	0.87 deg. C
Humidity SCH-01	3.5 %
Temperature SCH-02	2.0 deg. C
Humidity SCH-02	6.7 %
Voltage	0.92 %

3.5 Test Location

UL Japan, Inc. Shonan EMC Lab.

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

Telephone: +81-463-50-6400

A2LA Certificate Number: 1266.03

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

Test site	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Maximum measurement distance
No.1 Semi-anechoic chamber	2973D-1	20.6 x 11.3 x 7.65	20.6 x 11.3	10 m
No.2 Semi-anechoic chamber	2973D-2	20.6 x 11.3 x 7.65	20.6 x 11.3	10 m
No.3 Semi-anechoic chamber	2973D-3	12.7 x 7.7 x 5.35	12.7 x 7.7	5 m
No.4 Semi-anechoic chamber	-	8.1 x 5.1 x 3.55	8.1 x 5.1	-
No.1 Shielded room	-	6.8 x 4.1 x 2.7	6.8 x 4.1	-
No.2 Shielded room	-	6.8 x 4.1 x 2.7	6.8 x 4.1	-
No.3 Shielded room	-	6.3 x 4.7 x 2.7	6.3 x 4.7	-
No.4 Shielded room	-	4.4 x 4.7 x 2.7	4.4 x 4.7	-
No.5 Shielded room	-	7.8 x 6.4 x 2.7	7.8 x 6.4	-
No.6 Shielded room	-	7.8 x 6.4 x 2.7	7.8 x 6.4	-
No.8 Shielded room	-	3.45 x 5.5 x 2.4	3.45 x 5.5	-
No.1 Measurement room	-	2.55 x 4.1 x 2.5	-	-

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)

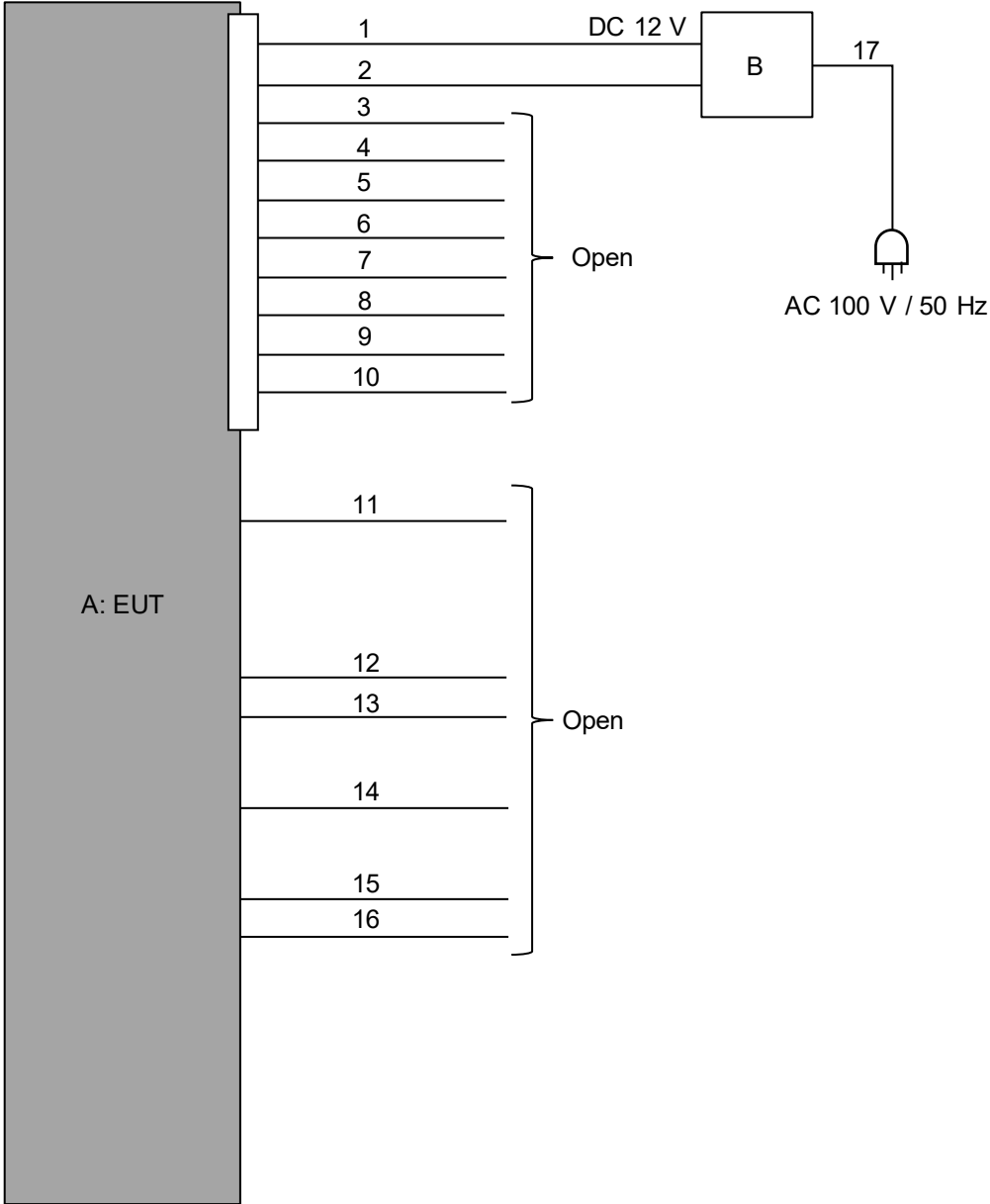
Mode	Remarks*
Bluetooth (BT)	BR / EDR, Payload: PRBS9
<p>*EUT has the power settings by the software as follows; Power Setting: Fixed Software: Application Version: V104.RF13 System Version: V107 (Date: 2022.07.22, Storage location: EUT memory)</p> <p>*This setting of software is the worst case. Any 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.</p>	

Details of Operating Mode(s)

Test Item	Mode	Hopping	Tested Frequency
Conducted Spurious Emission	Tx DH5 Tx 3DH5	Off	2402 MHz 2441 MHz 2480 MHz
Carrier Frequency Separation	Tx DH5 Tx 3DH5	On	2402 MHz 2441 MHz 2480 MHz
20dB Bandwidth	Tx DH5 Tx 3DH5	Off	2402 MHz 2441 MHz 2480 MHz
Number of Hopping Frequency	Tx DH5 Tx 3DH5	On	-
Dwell time	Tx DH1, DH3, DH5 Tx 3DH1, 3DH3, 3DH5	On	-
Maximum Peak Output Power	Tx DH5 Tx 2DH5 Tx 3DH5	Off	2402 MHz 2441 MHz 2480 MHz
Band Edge Compliance (Conducted)	Tx DH5 Tx 3DH5	On ----- Off	2402 MHz 2480 MHz
99% Occupied Bandwidth	Tx DH5 Tx 3DH5	On ----- Off	2402 MHz 2441 MHz 2480 MHz

*As a result of preliminary test, the formal test was performed with the above modes, which had the maximum payload length (except Dwell time test)
 *2DH mode (2Mb/s EDR: pi/4DQPSK) was excluded for other tests than power measurement by using 3DH mode (3 Mb/s EDR: 8DPSK) as a representative.
 *It is considered that the non-tested packet type (e.g. inquiry) can be omitted as it is complied with above all the test items based on Bluetooth Core specification.

4.2 Configuration and Peripherals



Description of EUT and Support Equipment

No.	Item	Model number	Serial Number	Manufacturer	Remarks
A	Monitor with Receiver	DMX809S	118X0091	JVCKENWOOD Corporation	EUT
B	Power Supply (DC)	PAN35-10A	DE001677	KIKUSUI	-

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	DC (ACC, B+)	1.5	Unshielded	Unshielded	-
2	DC (GND)	1.5	Unshielded	Unshielded	-
3	Speaker (Front-L) +/-	0.15	Unshielded	Unshielded	-
4	Speaker (Front-R) +/-	0.15	Unshielded	Unshielded	-
5	Speaker (Rear-L) +/-	0.15	Unshielded	Unshielded	-
6	Speaker (Rear-R) +/-	0.15	Unshielded	Unshielded	-
7	ILLUMI	0.15	Unshielded	Unshielded	-
8	ANT Cont	0.15	Unshielded	Unshielded	-
9	Mute	0.15	Unshielded	Unshielded	-
10	REMOTE Cont	0.15	Unshielded	Unshielded	-
11	USB	1.0	Shielded	Shielded	-
12	PRK SW	0.1	Unshielded	Unshielded	-
13	REVERSE	0.1	Unshielded	Unshielded	-
14	Mic	0.15	Shielded	Shielded	-
15	FM/AM	0.15	Shielded	Shielded	-
16	Front View Camera	0.2	Shielded	Shielded	-
17	AC	2.0	Unshielded	Unshielded	-

SECTION 5: 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
20dB Bandwidth	3 MHz	30 kHz	100 kHz	Auto	Peak	Max Hold	Spectrum Analyzer
99% Occupied Bandwidth *1)	Enough width to display emission skirts	1 to 5 % of OBW	Three times of RBW	Auto	Peak	Max Hold	Spectrum Analyzer
Maximum Peak Output Power	-	-	-	Auto	Peak Average *2)	-	Power Meter (Sensor: 160 MHz BW)
Carrier Frequency Separation	3 MHz	100 kHz	300 kHz	Auto	Peak	Max Hold	Spectrum Analyzer
Number of Hopping Frequency	30 MHz	300 kHz	1 MHz	Auto	Peak	Max Hold	Spectrum Analyzer
Dwell Time	Zero Span	100 kHz, 1 MHz	300 kHz, 3 MHz	As necessary capture the entire dwell time per hopping channel	Peak	Clear Write	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				
	30 MHz to 25 GHz	100 kHz	300 kHz				
Conducted Spurious Emission Band Edge compliance	10 MHz	100 kHz	300 kHz	Auto	Peak	Max Hold	Spectrum Analyzer

*1) Peak hold was applied as Worst-case measurement.
*2) Reference data
*3) In the frequency range below 30MHz, RBW was narrowed to separate the noise contents. Then, wide-band noise near the limit was checked separately, however the noise was not detected as shown in the chart. (9 kHz -150 kHz: RBW = 200 Hz, 150 kHz - 30 MHz: RBW = 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 Ohmes. For example, the measurement at frequency 9 kHz resulted in a level of 45.5 dBuV/m, which is equivalent to $45.5 - 51.5 = -6.0$ dBuA/m, which has the same margin, 3 dB, to the corresponding RSS-Gen Table 6 limit as it has to 15.209(a) limit.

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

Test Data : APPENDIX
Test Result : Pass

APPENDIX 1: Test data

20dB Bandwidth, 99%Occupied Bandwidth and Carrier Frequency Separation

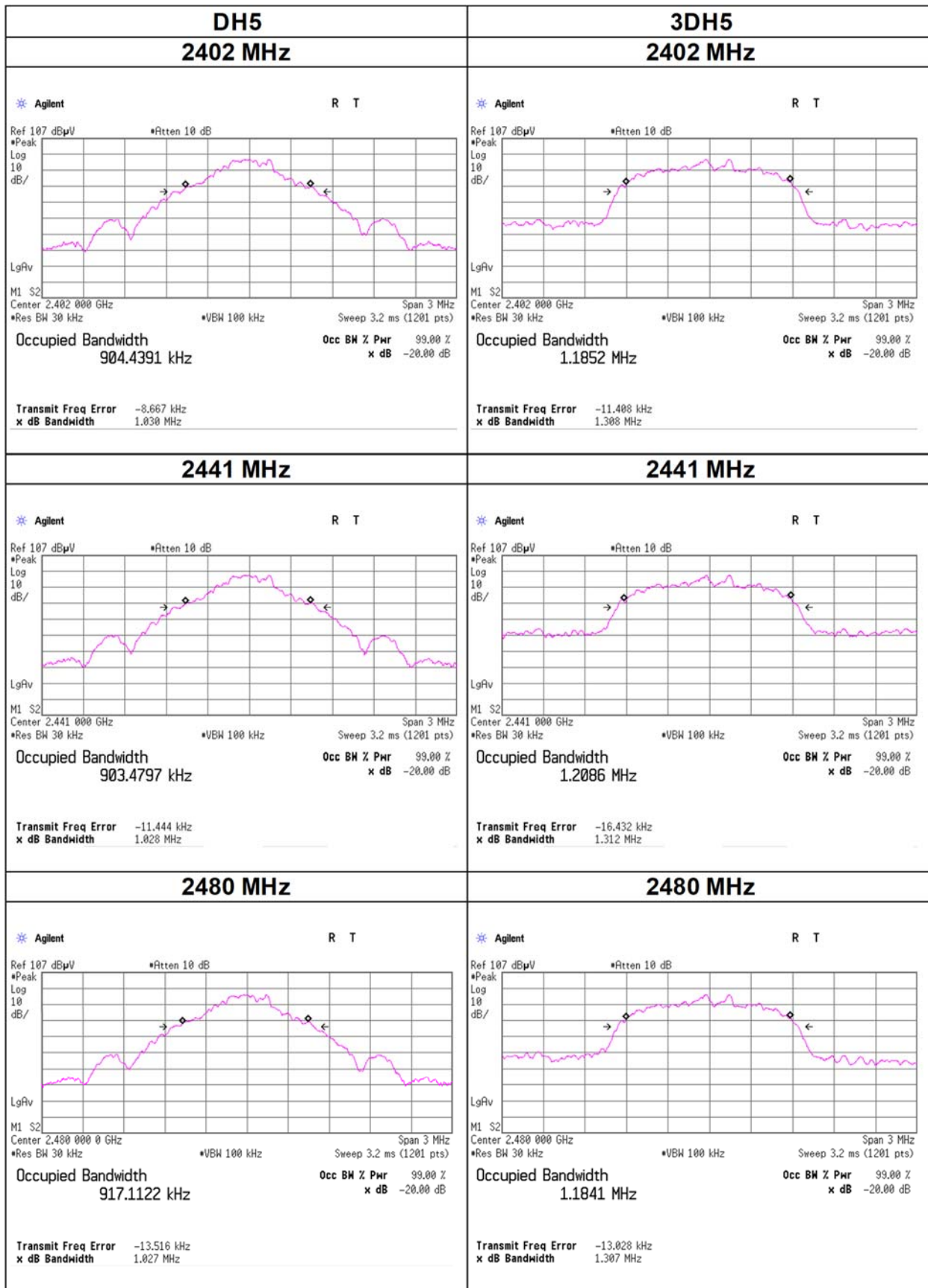
Test place Shonan EMC Lab. No.2 Shielded Room
Date August 14, 2023
Temperature / Humidity 23 deg. C / 56 % RH
Engineer Yosuke Murakami
Mode Tx, Hopping Off, Tx, Hopping On

Mode	Freq. [MHz]	20 dB Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]	Carrier Frequency Separation [MHz]	Limit for Carrier Frequency separation [MHz]
DH5	2402.0	1.030	904.4	1.000	>= 0.687
DH5	2441.0	1.028	903.5	1.000	>= 0.685
DH5	2480.0	1.027	917.1	1.000	>= 0.685
DH5	Hopping On	-	78522.8	-	-
3DH5	2402.0	1.308	1185.2	1.000	>= 0.872
3DH5	2441.0	1.312	1208.6	1.000	>= 0.875
3DH5	2480.0	1.307	1184.1	1.000	>= 0.871
3DH5	Hopping On	-	78634.9	-	-

Limit: Two-thirds of 20 dB Bandwidth or 25 kHz (whichever is greater).

No limit applies to 20 dB Bandwidth.

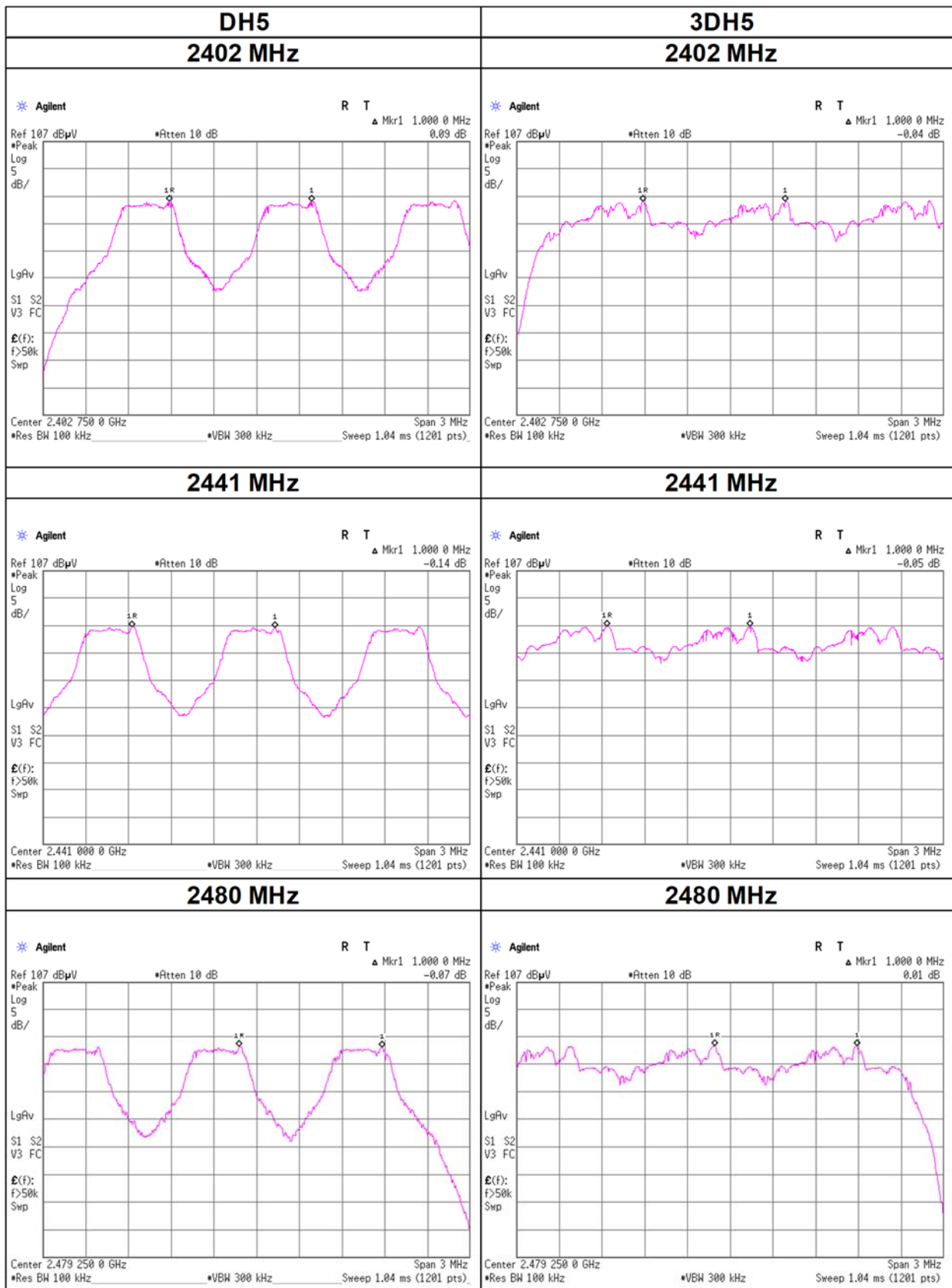
20dB Bandwidth and 99% Occupied Bandwidth



20dB Bandwidth and 99% Occupied Bandwidth



Carrier Frequency Separation



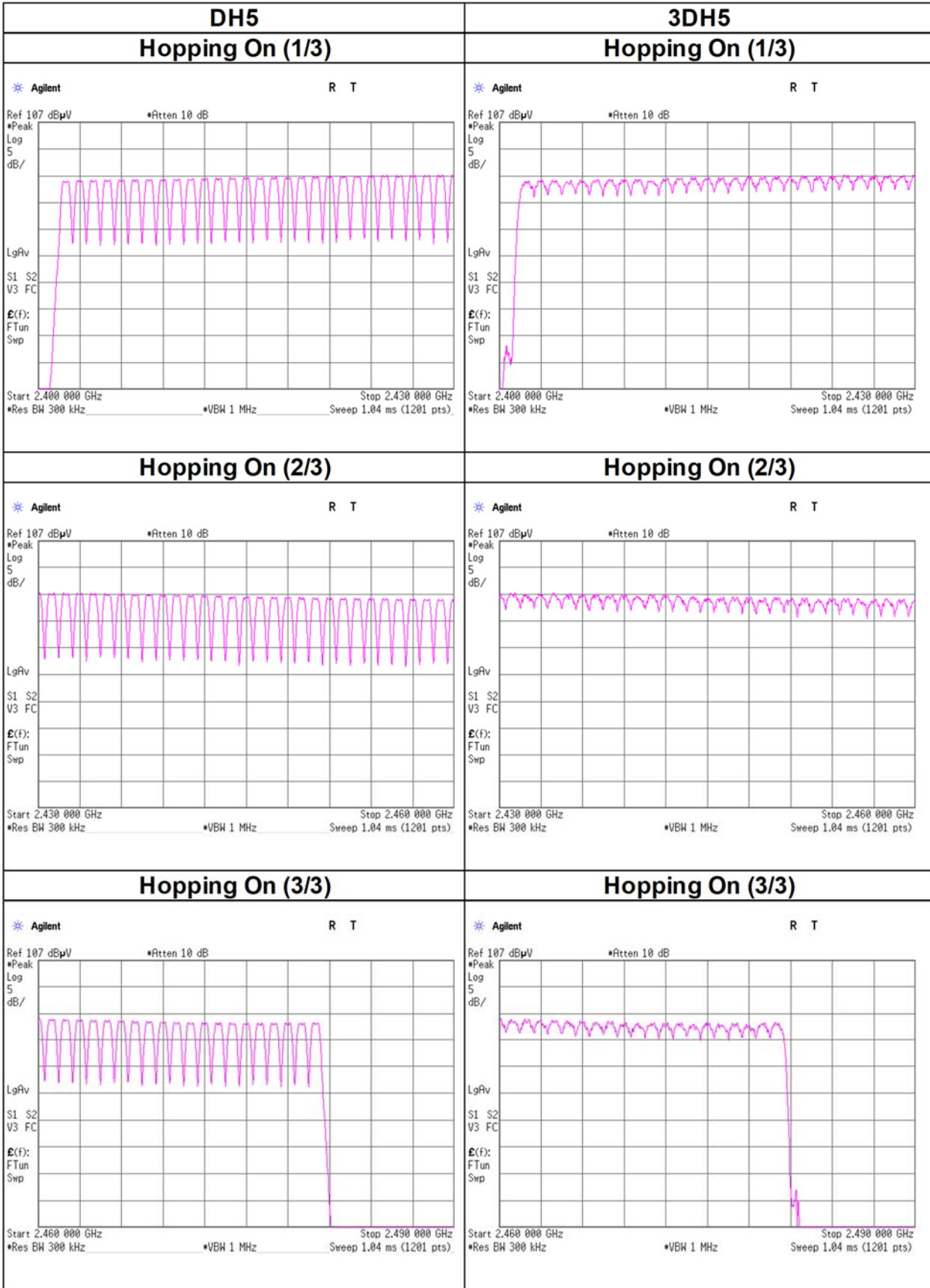
Number of Hopping Frequency

Test place Shonan EMC Lab. No.2 Shielded Room
Date August 14, 2023
Temperature / Humidity 23 deg. C / 56 % RH
Engineer Yosuke Murakami
Mode Tx, Hopping On

Mode	Number of channel [channels]	Limit [channels]
DH5	79	>= 15
3DH5	79	>= 15

Test was not performed at AFH mode whose number of hopping channel is 20 channels because this Bluetooth radio is in compliance of Bluetooth Specification.

Number of Hopping Frequency



Dwell time

Test place	Shonan EMC Lab. No.2 Shielded Room
Date	August 14, 2023
Temperature / Humidity	23 deg. C / 56 % RH
Engineer	Yosuke Murakami
Mode	Tx, Hopping On

Mode	Number of transmission in a 31.6 (79 Hopping x 0.4)	Length of transmission [ms]	Result [ms]	Limit [ms]
DH1	51.4 times / 5 s x 31.6 s = 325 times	0.401	130	400
DH3	27.6 times / 5 s x 31.6 s = 175 times	1.659	290	400
DH5	20.8 times / 5 s x 31.6 s = 132 times	2.908	384	400
3DH1	50.6 times / 5 s x 31.6 s = 320 times	0.406	130	400
3DH3	26.8 times / 5 s x 31.6 s = 170 times	1.659	282	400
3DH5	20.8 times / 5 s x 31.6 s = 132 times	2.909	384	400

Sample Calculation

Result = Number of transmission x Length of transmission

*Average data of 5 tests.

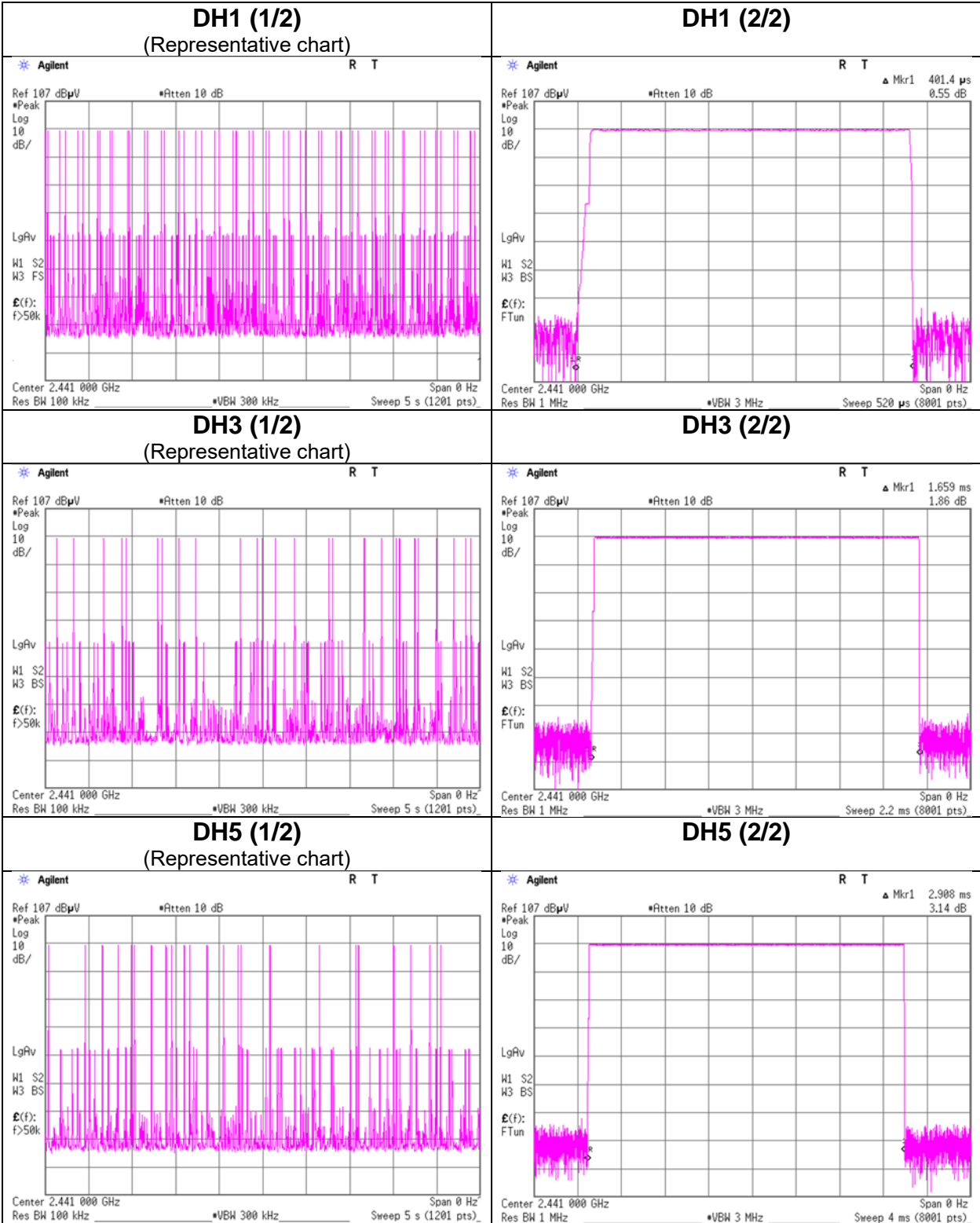
Mode	Sampling [times]					Average [times]
	1	2	3	4	5	
DH1	51	52	51	51	52	51.4
DH3	26	28	32	27	25	27.6
DH5	23	20	20	19	22	20.8
3DH1	51	50	50	51	51	50.6
3DH3	25	28	26	27	28	26.8
3DH5	22	21	18	23	20	20.8

Sample Calculation

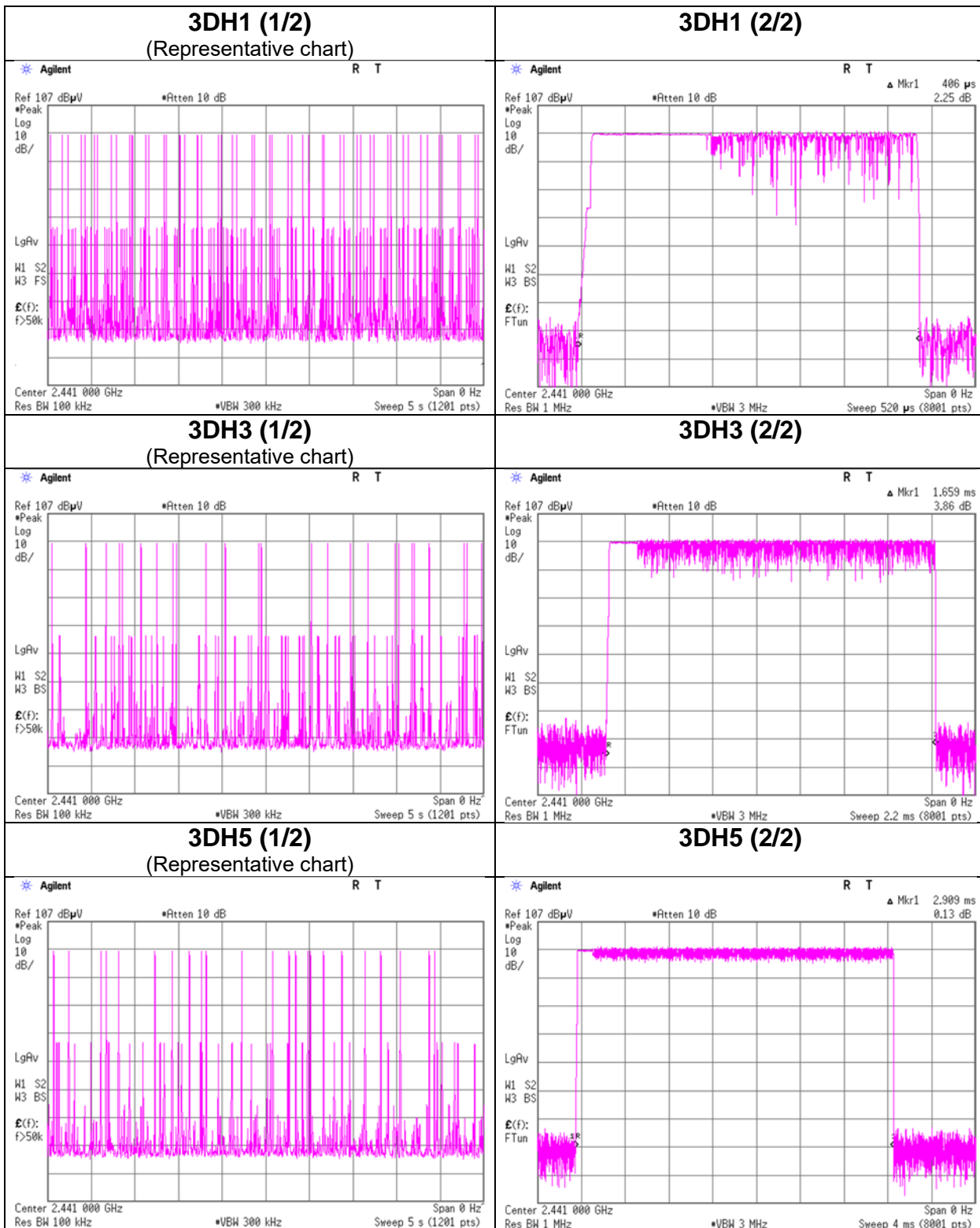
Average = Summation (Sampling 1 to 5) / 5

This device complies with the Bluetooth protocol for FHSS operation, employing a pseudo random channel selection and hopping rate to ensure that the occupancy time in $N \times 0.4$ s, where N is the number of channels being used in the hopping sequence ($20 \leq N \leq 79$), is always less than 0.4 s regardless of packet size. This is confirmed in the test report for $N = 79$.

Dwell time



Dwell time



Maximum Peak Output Power

Test place	Shonan EMC Lab. No.5 Shielded Room (3DH5) Shonan EMC Lab. No.2 Shielded Room (DH5, 2DH5)	
Date	July 12, 2023	August 14, 2023
Temperature / Humidity	24 deg. C / 41 % RH	23 deg. C / 56 % RH
Engineer	Yosuke Murakami (3DH5)	Yosuke Murakami (DH5, 2DH5)
Mode	Tx, Hopping Off	

Mode	Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Conducted Power					e.i.r.p. for RSS-247					
					Result		Limit		Margin [dB]	Antenna Gain [dBi]	Result		Limit		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]			[dBm]	[mW]	[dBm]	[mW]	
DH5	2402	-10.36	1.82	10.18	1.64	1.46	20.97	125	19.33	-12.30	-10.66	0.09	36.02	4000	46.68
DH5	2441	-9.72	1.83	10.18	2.29	1.69	20.97	125	18.68	-12.30	-10.01	0.10	36.02	4000	46.03
DH5	2480	-11.07	1.83	10.18	0.94	1.24	20.97	125	20.03	-12.30	-11.36	0.07	36.02	4000	47.38
2DH5	2402	-9.04	1.82	10.18	2.96	1.98	20.97	125	18.01	-12.30	-9.34	0.12	36.02	4000	45.36
2DH5	2441	-8.69	1.83	10.18	3.32	2.15	20.97	125	17.65	-12.30	-8.98	0.13	36.02	4000	45.00
2DH5	2480	-9.64	1.83	10.18	2.37	1.73	20.97	125	18.60	-12.30	-9.93	0.10	36.02	4000	45.95
3DH5	2402	-8.83	1.82	10.18	3.17	2.07	20.97	125	17.80	-12.30	-9.13	0.12	36.02	4000	45.15
3DH5	2441	-8.51	1.83	10.18	3.50	2.24	20.97	125	17.47	-12.30	-8.80	0.13	36.02	4000	44.82
3DH5	2480	-9.26	1.83	10.18	2.75	1.88	20.97	125	18.22	-12.30	-9.55	0.11	36.02	4000	45.57

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

e.i.r.p. Result = Conducted Power Result + Antenna Gain

*The equipment and cables were not used for factor 0 dB of the data sheets.

Test was not performed at AFH mode, because the decrease of number of channel (min: 20 ch) at AFH mode does not influence on the output power and bandwidth of the EUT.
As this device had AFH mode and frequency separation could not meet the requirement of over 20 dB BW without 2/3 relaxation, 125 mW power limit was applied to it.

Average Output Power
(Reference data for RF Exposure)

Test place	Shonan EMC Lab. No.5 Shielded Room (3DH5) Shonan EMC Lab. No.2 Shielded Room (DH5, 2DH5)	
Date	July 12, 2023	August 14, 2023
Temperature / Humidity	24 deg. C / 41 % RH	23 deg. C / 56 % RH
Engineer	Yosuke Murakami (3DH5)	Yosuke Murakami (DH5, 2DH5)
Mode	Tx, Hopping Off	

Mode	Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Time average)		Duty factor [dB]	Result (Burst power average)	
					[dBm]	[mW]		[dBm]	[mW]
DH5	2402	-11.94	1.82	10.18	0.06	1.01	1.12	1.18	1.31
DH5	2441	-11.25	1.83	10.18	0.76	1.19	1.12	1.88	1.54
DH5	2480	-12.77	1.83	10.18	-0.76	0.84	1.12	0.36	1.09
2DH5	2402	-12.47	1.82	10.18	-0.47	0.90	1.12	0.65	1.16
2DH5	2441	-11.73	1.83	10.18	0.28	1.07	1.12	1.40	1.38
2DH5	2480	-13.27	1.83	10.18	-1.26	0.75	1.12	-0.14	0.97
3DH5	2402	-12.31	1.75	10.17	-0.39	0.91	1.11	0.72	1.18
3DH5	2441	-11.53	1.75	10.17	0.39	1.09	1.11	1.50	1.41
3DH5	2480	-13.04	1.75	10.17	-1.12	0.77	1.11	-0.01	1.00

Sample Calculation:

Result (Time average) = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

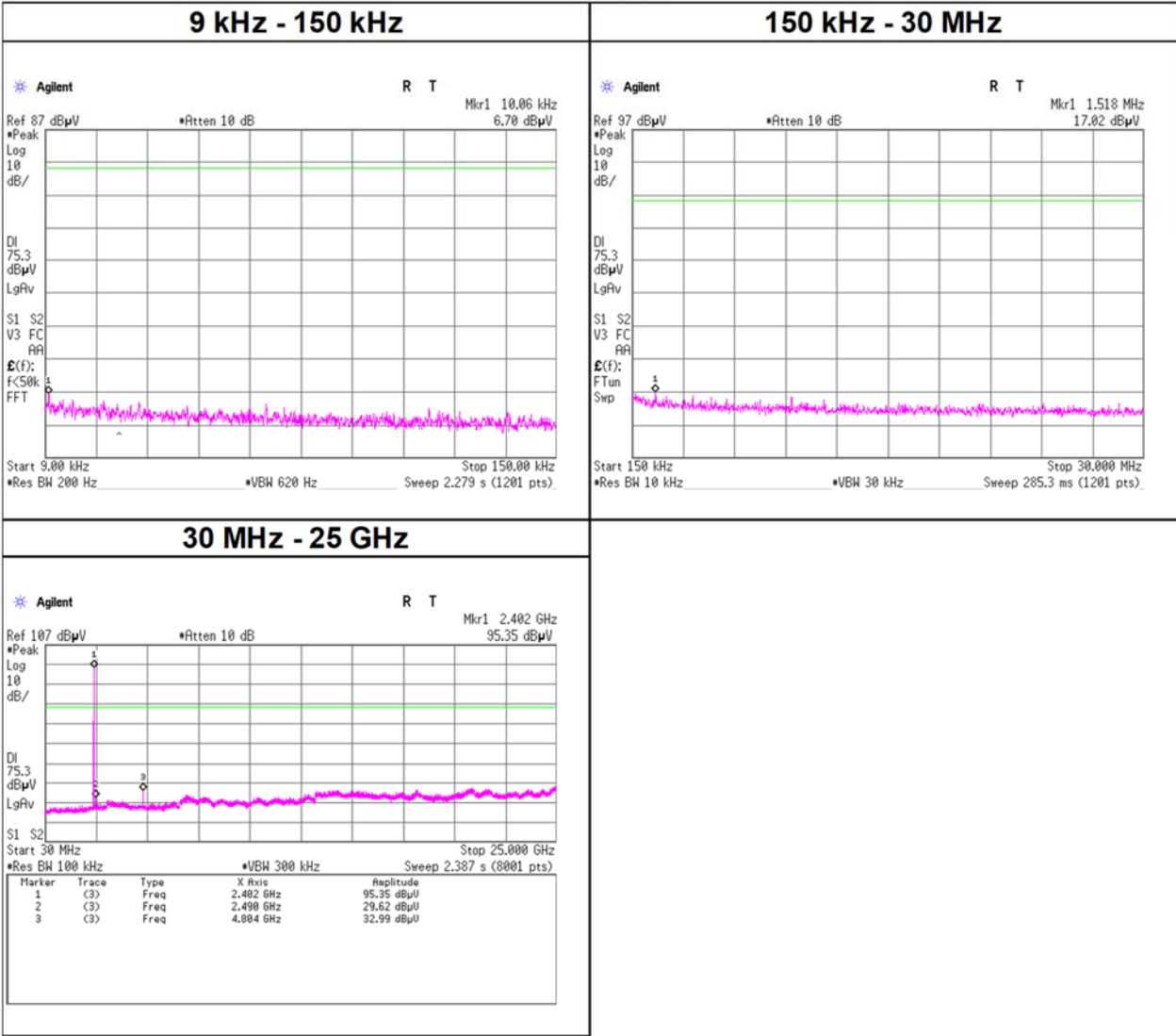
Result (Burst power average) = Result (Time average) + Duty factor

*The equipment and cables were not used for factor 0 dB of the data sheets.

Conducted Spurious Emission

Test place Shonan EMC Lab. No.2 Shielded Room
 Date August 14, 2023
 Temperature / Humidity 23 deg. C / 56 % RH
 Engineer Yosuke Murakami
 Mode Tx, Hopping Off, DH5

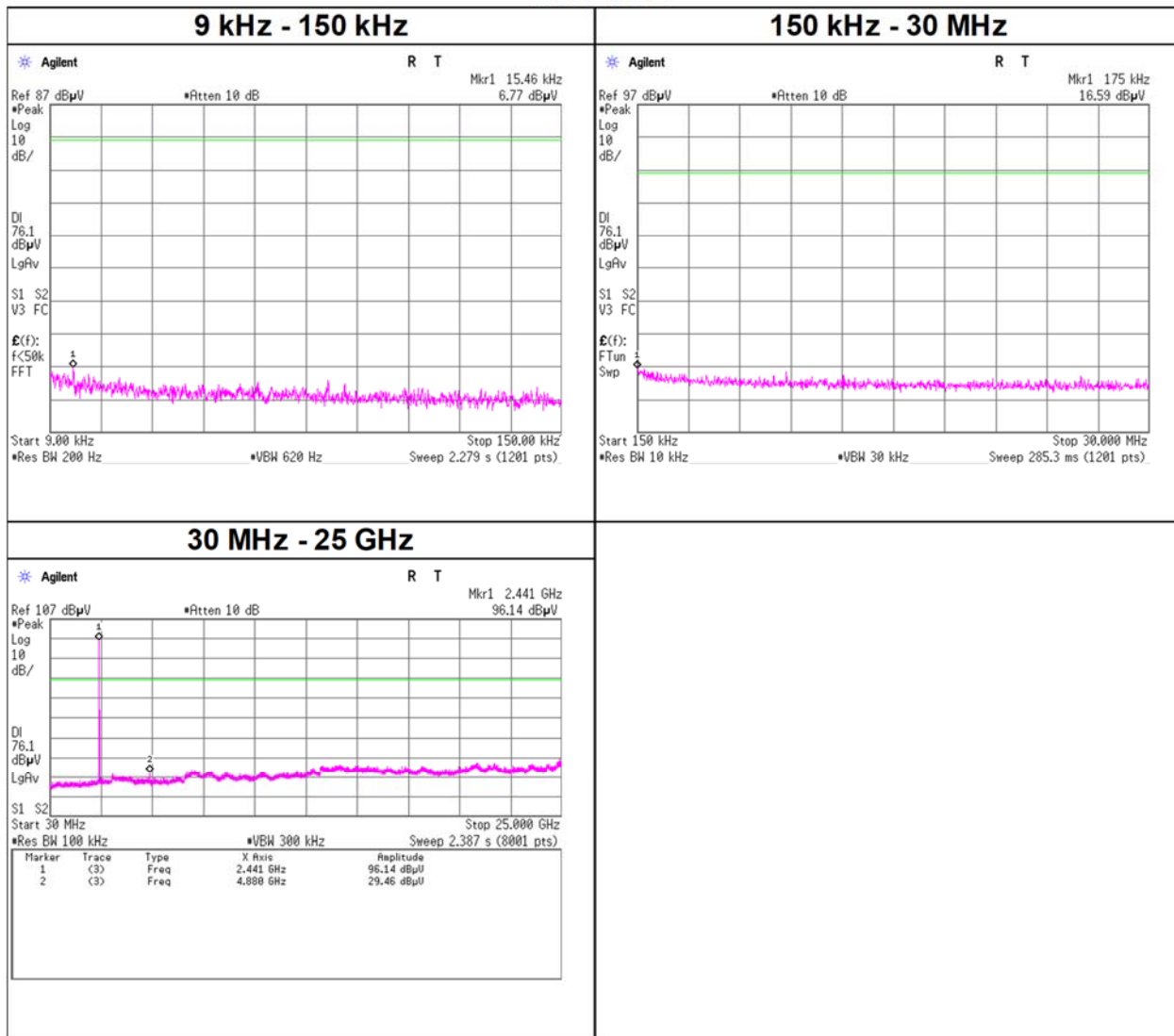
2402 MHz



Conducted Spurious Emission

Test place Shonan EMC Lab. No.2 Shielded Room
Date August 14, 2023
Temperature / Humidity 23 deg. C / 56 % RH
Engineer Yosuke Murakami
Mode Tx, Hopping Off, DH5

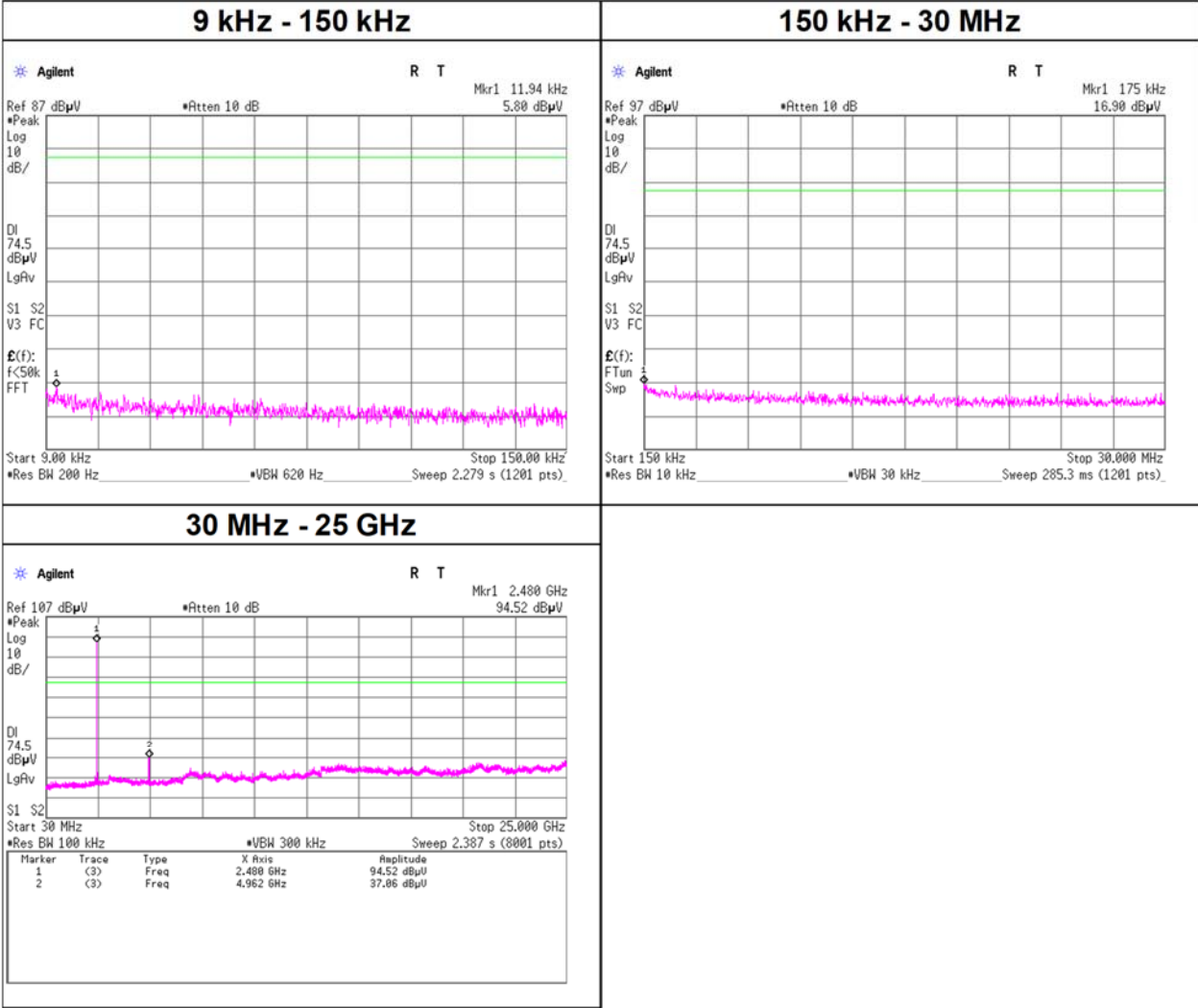
2441 MHz



Conducted Spurious Emission

Test place Shonan EMC Lab. No.2 Shielded Room
 Date August 14, 2023
 Temperature / Humidity 23 deg. C / 56 % RH
 Engineer Yosuke Murakami
 Mode Tx, Hopping Off, DH5

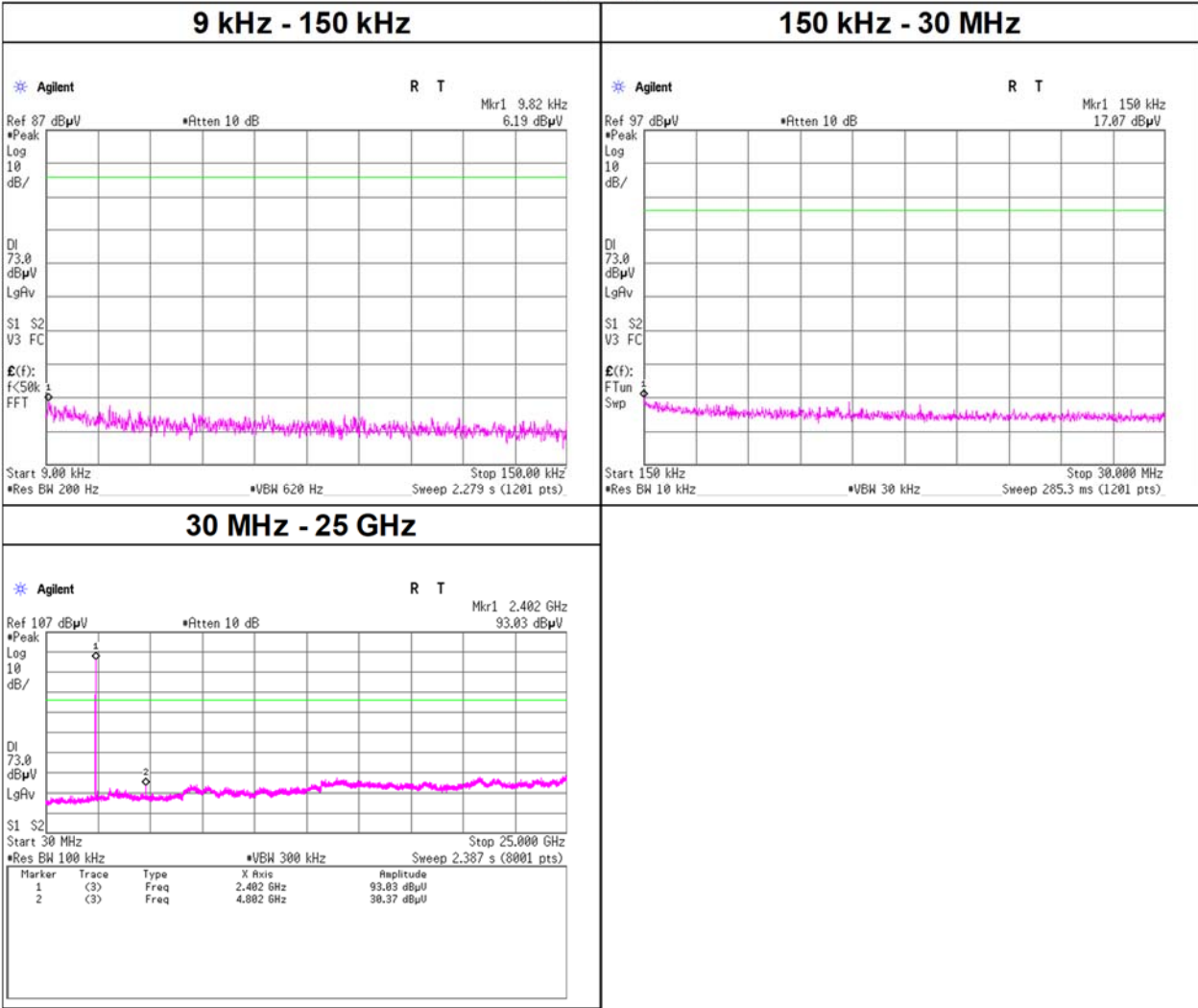
2480 MHz



Conducted Spurious Emission

Test place Shonan EMC Lab. No.2 Shielded Room
 Date August 14, 2023
 Temperature / Humidity 23 deg. C / 56 % RH
 Engineer Yosuke Murakami
 Mode Tx, Hopping Off, 3DH5

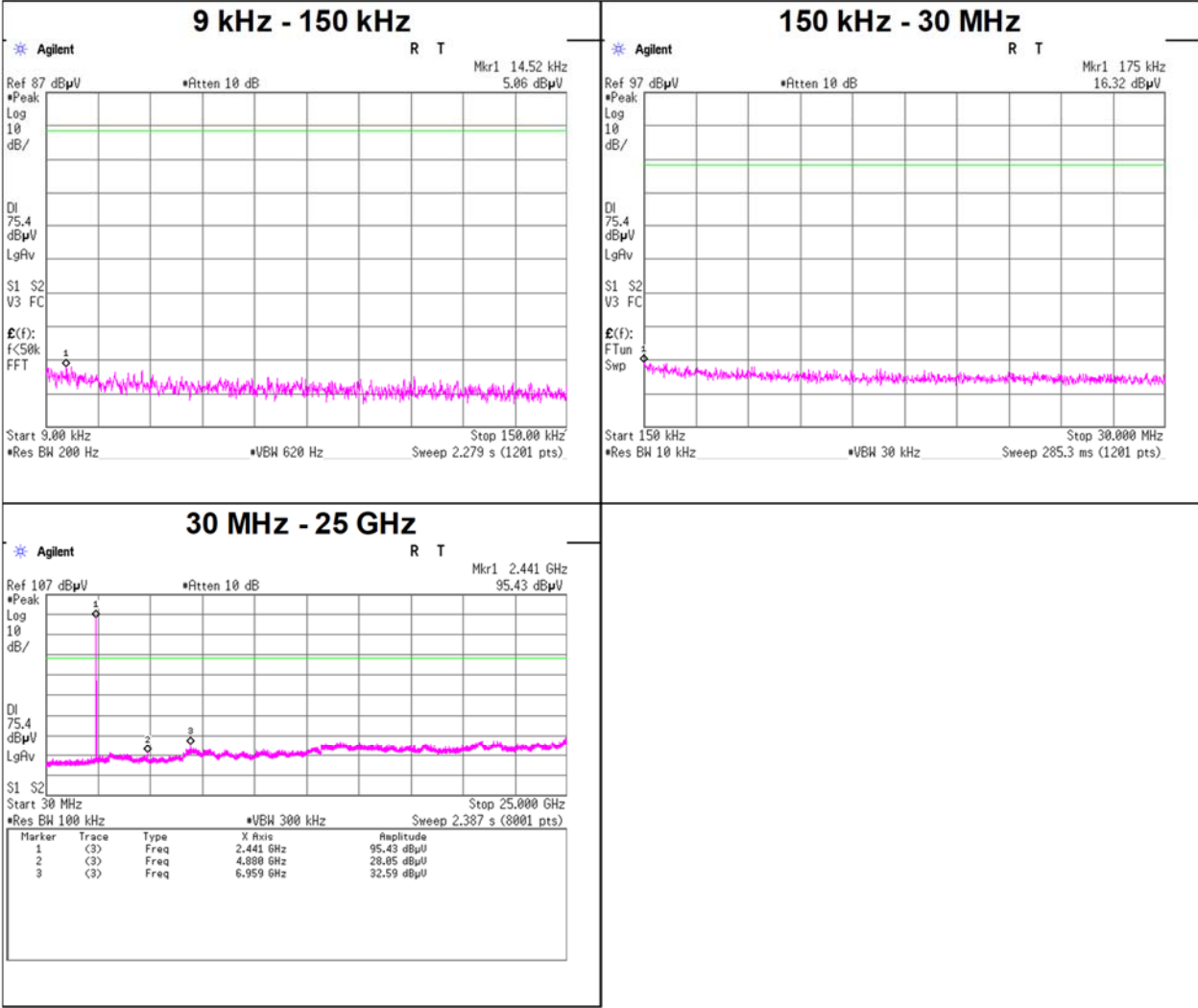
2402 MHz



Conducted Spurious Emission

Test place Shonan EMC Lab. No.2 Shielded Room
 Date August 14, 2023
 Temperature / Humidity 23 deg. C / 56 % RH
 Engineer Yosuke Murakami
 Mode Tx, Hopping Off, 3DH5

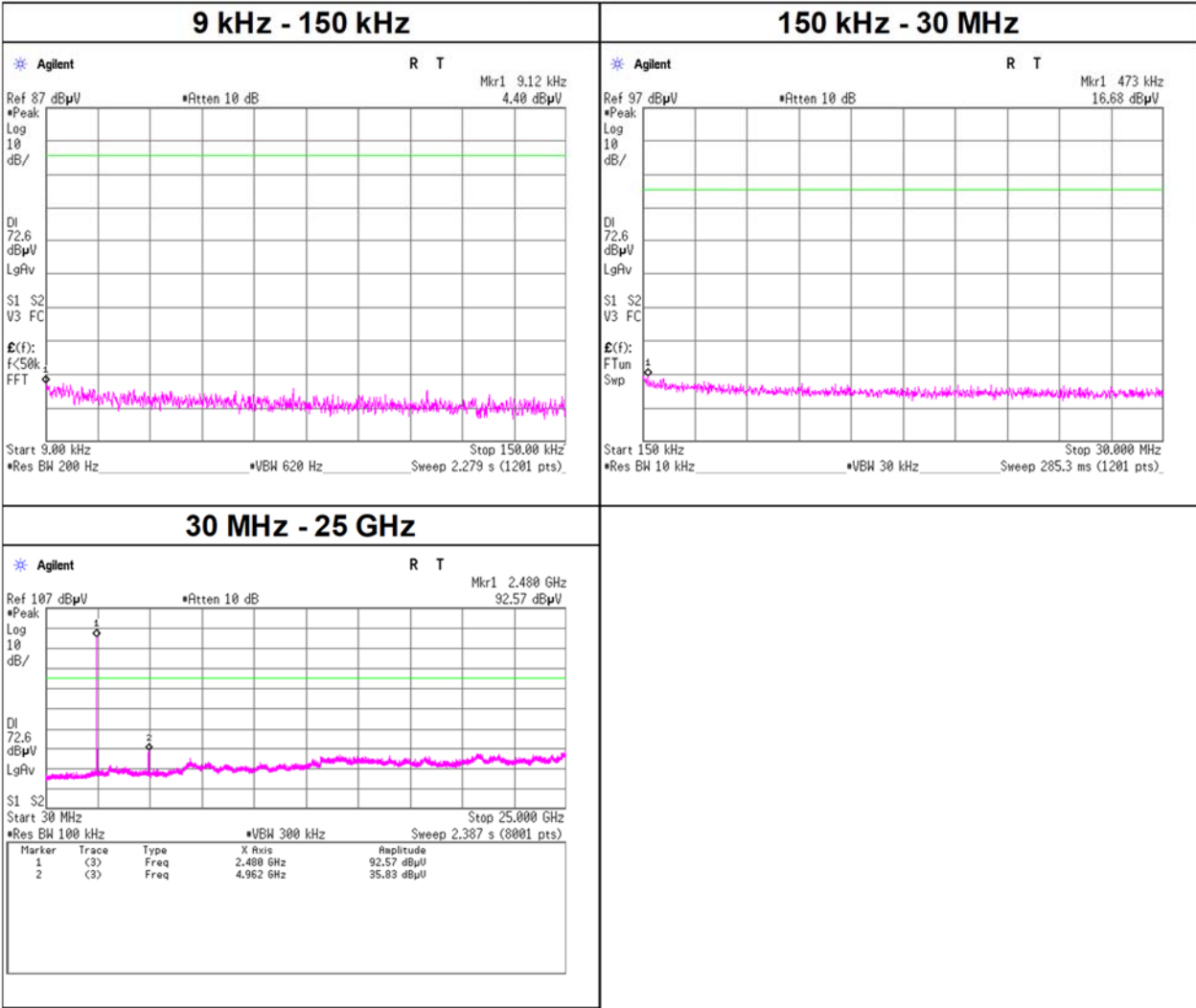
2441 MHz



Conducted Spurious Emission

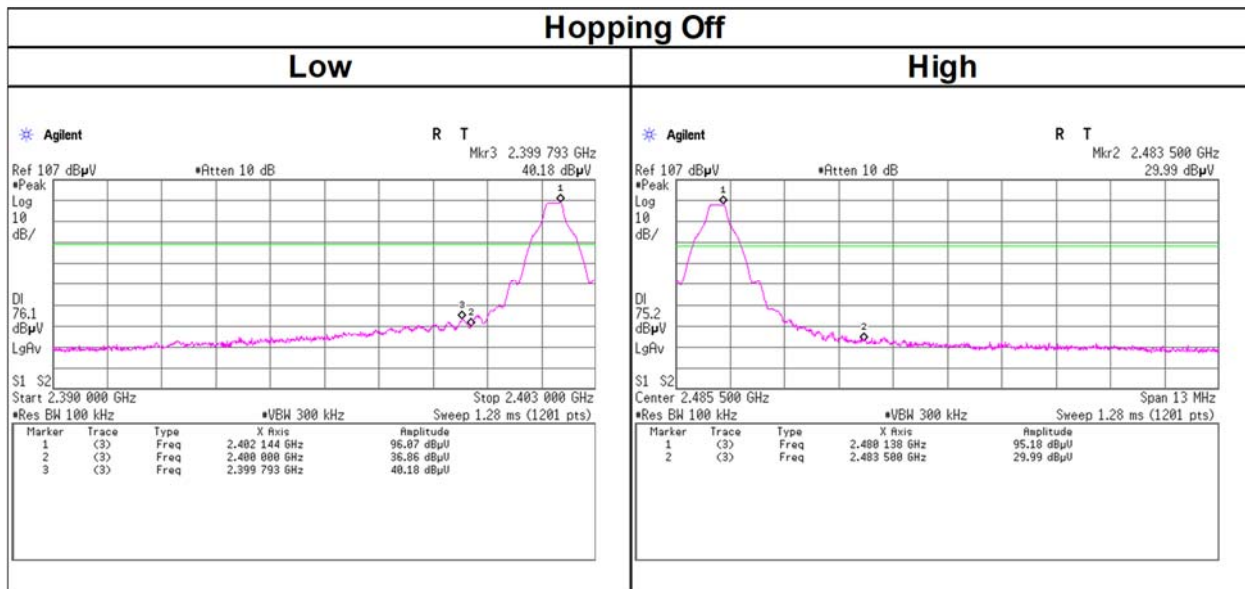
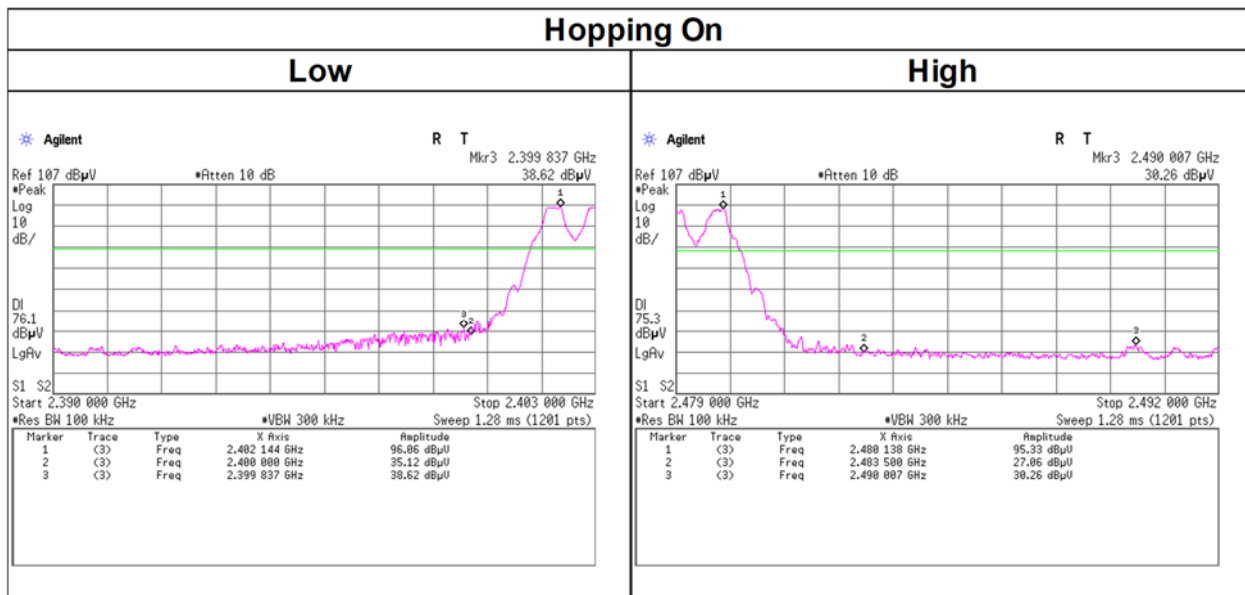
Test place Shonan EMC Lab. No.2 Shielded Room
 Date August 14, 2023
 Temperature / Humidity 23 deg. C / 56 % RH
 Engineer Yosuke Murakami
 Mode Tx, Hopping Off, 3DH5

2480 MHz



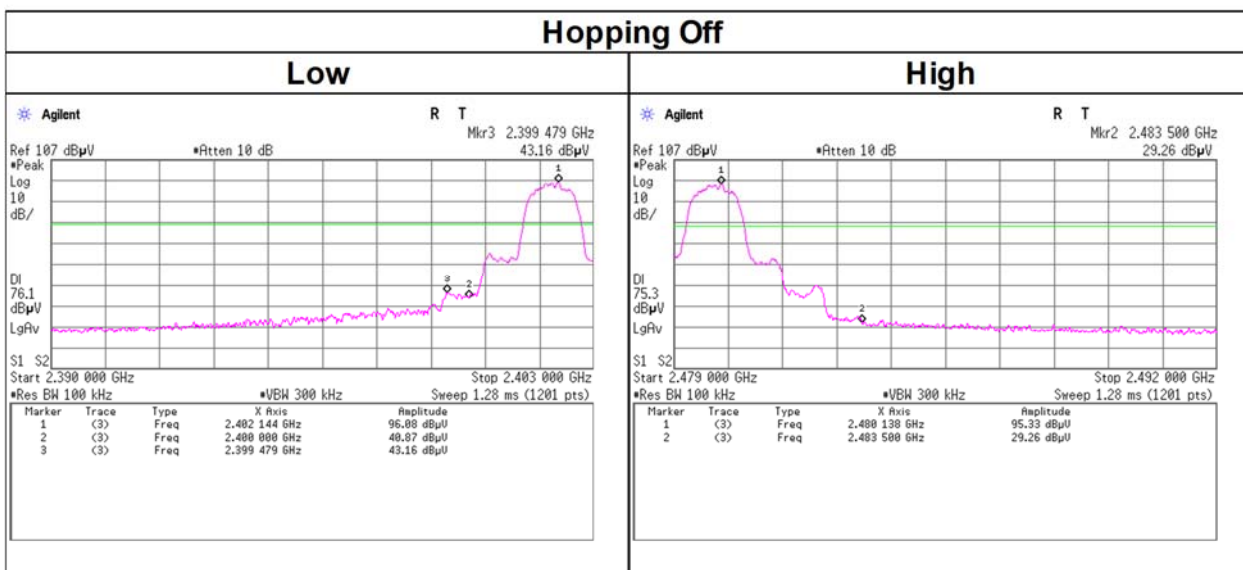
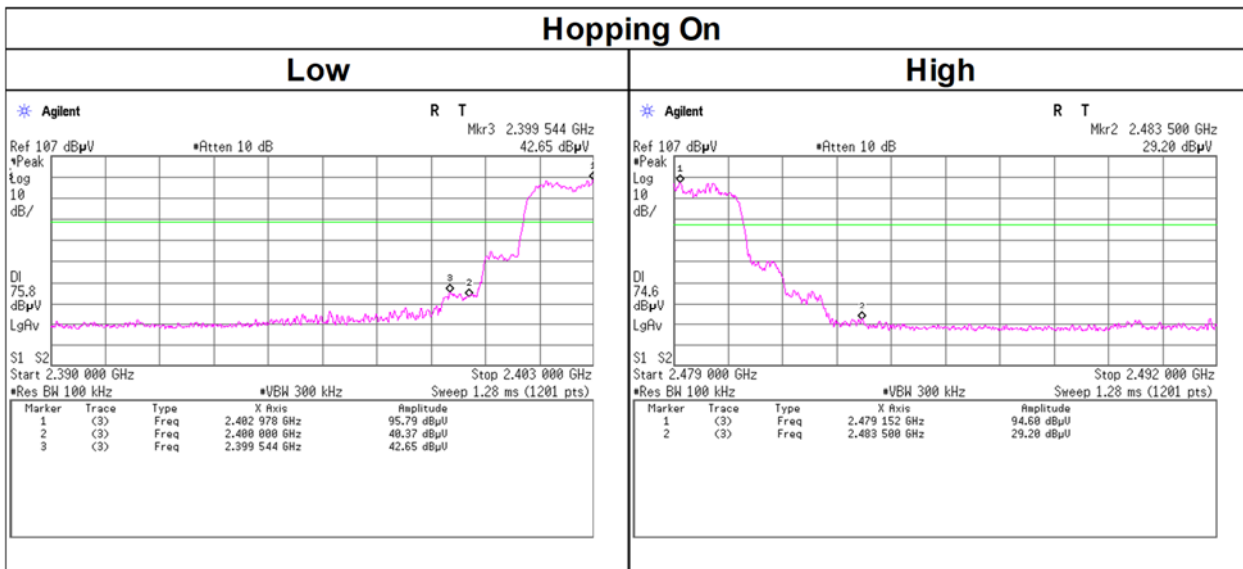
Conducted Emission Band Edge compliance

Test place	Shonan EMC Lab. No.2 Shielded Room
Date	August 14, 2023
Temperature / Humidity	23 deg. C / 56 % RH
Engineer	Yosuke Murakami
Mode	Tx DH5



Conducted Emission Band Edge compliance

Test place	Shonan EMC Lab. No.2 Shielded Room
Date	August 14, 2023
Temperature / Humidity	23 deg. C / 56 % RH
Engineer	Yosuke Murakami
Mode	Tx 3DH5



APPENDIX 2: Test Instruments

Test Equipment

Test Item	Local ID	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Cal Int
AT	SAT10-15	160493	Attenuator	Weinschel Corp.	54A-10	83406	2022/12/01	12
AT	SCC-G12	145040	Coaxial Cable	Suhner	SUCOFLEX 102	30790/2	2023/03/02	12
AT	SOS-22	191839	Thermo-Hygrometer	CUSTOM. Inc	CTH-201	-	2023/08/01	12
AT	SOS-27	191845	Thermo-Hygrometer	CUSTOM. Inc	CTH-201	-	2023/08/07	12
AT	SPM-13	169910	Power Meter	Keysight Technologies Inc	8990B	MY51000448	2022/11/08	12
AT	SPSS-06	169911	Power sensor	Keysight Technologies Inc	N1923A	MY57270004	2022/11/08	12
AT	SSA-02	145800	Spectrum Analyzer	Keysight Technologies Inc	E4448A	MY48250106	2023/03/01	12
AT	STM-G8	171615	Terminator	Weinschel - API Technologies Corp	M1459A	88997	2023/05/11	12
AT	STS-02	145793	Digital Hitester	HIOKI E.E. CORPORATION	3805-50	80997819	2023/05/26	12
AT	STS-05	146212	Digital Hitester	HIOKI E.E. CORPORATION	3805-50	80997828	2022/09/20	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