RADIO TEST REPORT

Test Report No. : 14027963S-A-R1

Applicant	:	**JVCKENWOOD Corporation**
Type of EUT	:	**Monitor with Receiver**
Model Number of EUT	:	**DMX958XR**
FCC ID	:	**IOMJ5268**
Test regulation	:	**FCC Part 15 Subpart C: 2021** ***Wireless LAN part**
Test item	:	**Antenna Terminal Conducted Tests**
Test Result	:	**Complied (Refer to SECTION 3)**

1. This test report shall not be reproduced in full or partial, without the written approval of UL Japan, Inc.
2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the limits of the above regulation.
4. The test results in this test report are traceable to the national or international standards.
5. This test report must not be used by the customer to claim product certification, approval, or endorsement by the A2LA accreditation body.
6. This test report covers Radio technical requirements.
   It does not cover administrative issues such as Manual or non-Radio test related Requirements. (if applicable)
7. The all test items in this test report are conducted by UL Japan, Inc. Shonan EMC Lab.
8. The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan has been accredited.
9. The information provided from the customer for this report is identified in SECTION 1.
10. This report is a revised version of 14027963S-A. 14027963S-A is replaced with this report.

Date of test: October 4 to 6, 2021

Representative test engineer: T. Kawakami
Takahiro Kawakami
Engineer

Approved by: K. Noda
Kazuya Noda
Leader

CERTIFICATE 1266.03

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

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REVISION HISTORY

Original Test Report No.: 14027963S-A

Revision	Test report No.	Date	Page revised	Contents
- (Original)	14027963S-A	November 10, 2021	-	-
1	14027963S-A-R1	November 24, 2021	P.10	Correction of Software “SoC” From: 0.0.0805.4800 To: 0.0.0805.4600

Reference: Abbreviations (Including words undescribed in this report)

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

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CONTENTS **PAGE**

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;
- Applicant, Type of EUT, Model Number of EUT, FCC ID on the cover and other relevant pages
- Operating/Test Mode(s) (Mode(s)) on all the relevant pages
- SECTION 1: Customer information
- SECTION 2: Equipment under test (EUT) other than the Receipt Date
- SECTION 4: Operation of EUT during testing

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

SECTION 2: Equipment under test (EUT)

2.1 Identification of EUT

Type	:	Monitor with Receiver
Model Number	:	DMX958XR
Serial Number	:	Refer to SECTION 4.2
Condition	:	Production prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Receipt Date	:	October 4, 2021
Modification	:	No Modification by the test lab

2.2 Product Description

Model: DMX958XR (referred to as the EUT in this report) is a Monitor with Receiver.

There are three variant models DMX908S, DMX9708S, KW-M875BW
These models are idetifical except for presence of Panel, Dashboard Camera control terminal,
HD Radio, HD Camera Ready, Display and these difference do not affect the radio.

General Specification

Rating : DC 12 V

Radio Specification

Type of radio	Bluetooth (BR/EDR)	IEEE802.11b	IEEE802.11g	IEEE802.11a	IEEE802.11n (20 MHz BW)	IEEE802.11n (40 MHz BW)	IEEE802.11ac
Frequency of operation	2402 MHz - 2480 MHz	2412 MHz - 2462 MHz	2412 MHz - 2462 MHz	5745 MHz - 5805 MHz	2412 MHz - 2462 MHz 5745 MHz - 5805 MHz	5755 MHz - 5795 MHz	5745 MHz-5805 MHz (20 MHz BW) 5755 MHz-5795 MHz (40 MHz BW) 5775 MHz (80 MHz BW)
Type of modulation	FHSS	DSSS (CCK, DQPSK, DBPSK)	OFDM-CCK (64QAM, 16QAM, QPSK, BPSK)	OFDM (64QAM, 16QAM, QPSK, BPSK)			OFDM (256QAM, 16QAM, QPSK, BPSK)
Channel spacing	1 MHz	5 MHz		20 MHz	2.4 GHz band 5 MHz 5 GHz band 20 MHz	40 MHz	20 MHz (20 MHz BW) 40 MHz (40 MHz BW) 80 MHz (80 MHz BW)

Antenna type	Internal Antenna (Chip Antenna)
Antenna Gain	Antenna 0 (ANT-0) : -7.7 dBi (2.4 GHz Wireless LAN only), -4.7 dBi (5 GHz) Antenna 1 (ANT-1) : -9.9 dBi (2.4 GHz Bluetooth only), -4.6 dBi (5 GHz)
Power Supply (radio art input)	DC 3.6 V/ 3.3 V/1.8 V
Clock frequency (Maximum)	37.4 MHz
Clock frequency in the system (Maximum)	6.2208 GHz

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C
FCC Part 15 final revised on May 3, 2021 and effective July 2, 2021

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

* Also the EUT complies with FCC Part 15 Subpart B.

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	N/A *1)	-
	ISED: RSS-Gen 8.8	**ISED:** RSS-Gen 8.8			
6dB Bandwidth	**FCC:** KDB 558074 D01 15.247 Meas Guidance v05r02	**FCC:** Section 15.247(a)(2)	See data.	Complied a)	Conducted
	ISED: -	**ISED:** RSS-247 5.2(a)			
Maximum Peak Output Power	**FCC:** KDB 558074 D01 15.247 Meas Guidance v05r02	**FCC:** Section 15.247(b)(3)		Complied b)	Conducted
	ISED: RSS-Gen 6.12	**ISED:** RSS-247 5.4(d)			
Power Density	**FCC:** KDB 558074 D01 15.247 Meas Guidance v05r02	**FCC:** Section 15.247(e)		Complied c)	Conducted
	ISED: -	**ISED:** RSS-247 5.2(b)			
Spurious Emission (below 30 MHz)	**FCC:** KDB 558074 D01 15.247 Meas Guidance v05r02	**FCC:** Section15.247(d)	See data.	Complied d)	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 No. 13-EM-W0420 and 13-EM-W0422.
*1) The test is not applicable since the EUT does not have AC Mains.

a) Refer to APPENDIX 1 (data of 6 dB Bandwidth and 99 % Occupied Bandwidth)
b) Refer to APPENDIX 1 (data of Maximum Peak Output Power)
c) Refer to APPENDIX 1 (data of Power Density)
d) Refer to APPENDIX 1 (data of Conducted Spurious Emission)

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

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

FCC Part 15.31 (e)
The 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	- a)	Conducted
a) Refer to APPENDIX 1 (data of 6 dB Bandwidth and 99 % Occupied Bandwidth)					

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

3.4 Uncertainty

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

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

Shonan EMC Lab.

Antenna terminal test	Uncertainty (+/-)
Power Measurement above 1 GHz (Average Detector)_SPM-06	1.2 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-06	2.0 dB
Power Measurement above 1 GHz (Average Detector)_SPM-07	1.2 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-07	1.3 dB
Power Measurement above 1 GHz (Average Detector)_SPM-13	1.3 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-13	1.3 dB
Spurious emission (Conducted) below 1GHz	0.93 dB
Spurious emission (Conducted) 1 GHz-3 GHz	0.92 dB
Spurious emission (Conducted) 3 GHz-18 GHz	2.3 dB
Spurious emission (Conducted) 18 GHz-26.5 GHz	2.3 dB
Spurious emission (Conducted) 26.5 GHz-40 GHz	2.3 dB
Bandwidth Measurement	0.012 %
Duty cycle and Time Measurement	0.27 %
Temperature_SCH-01	0.93 deg.C.
Humidity_SCH-01	4.1 %
Temperature_SCH-02	2.0 deg.C.
Humidity_SCH-02	6.6 %
Voltage	0.97 %

3.5 Test Location

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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)

Test operating mode was determined as follows according to "Section 1 of 6 802.11 a/b/g/n testing - Managing Complex Regulatory Approvals - " of TCB Council Workshop October 2009.

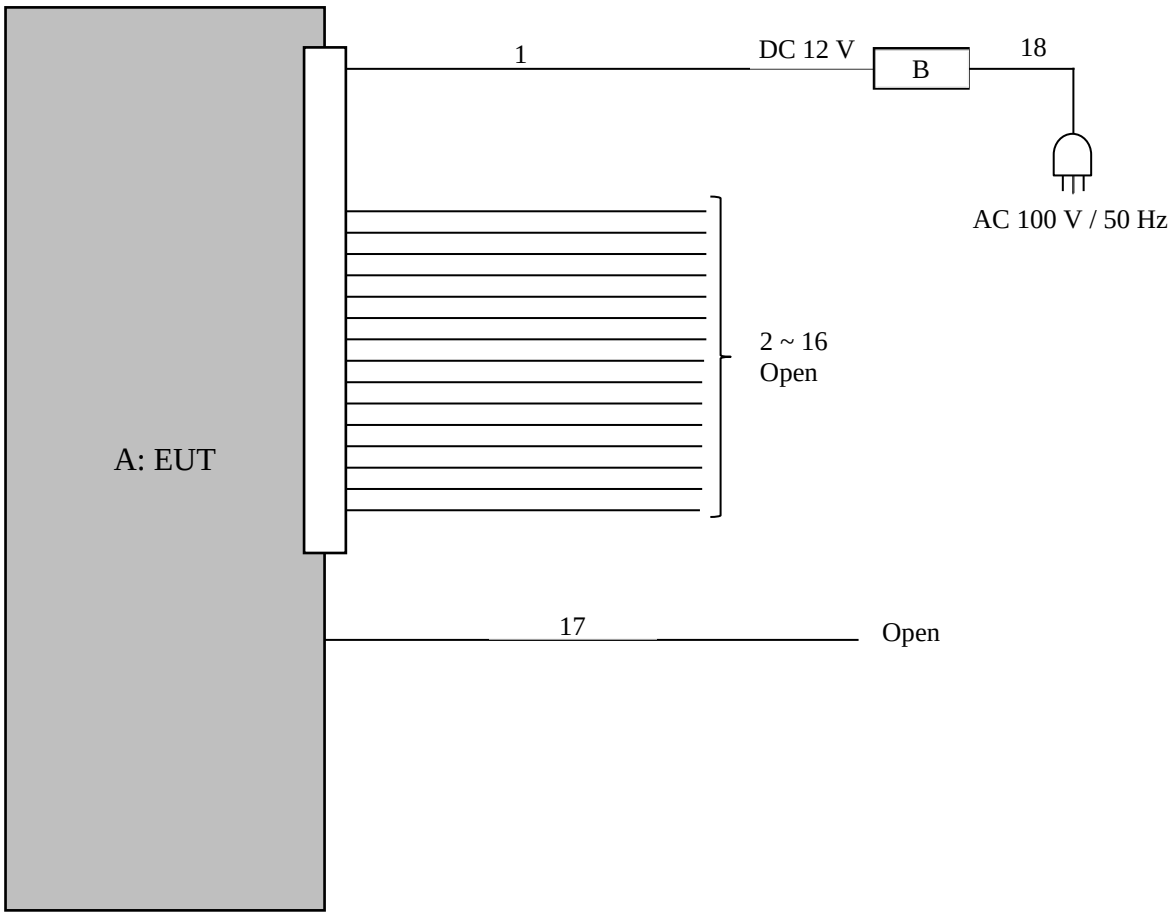
Mode	Remarks*
IEEE 802.11b (11b)	11 Mbps, PN9
IEEE 802.11g (11g)	48 Mbps, PN9
IEEE 802.11n 20 MHz BW (11n-20)	MCS 5, PN9
*The worst condition was determined based on the test result of Maximum Peak Output Power (Mid Channel)	
*Power of the EUT was set by the software as follows; Power settings: Fixed Software: SoC: 0.0.0805.4600 Syscom: 1.0.0479.3100 Panel: 1.0.0209.3700 (Date: 2021.10.4, 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 Operating mode(s)

Test Item	Operating Mode	Tested Antenna	Tested frequency
6 dB Bandwidth Maximum Peak Output Power Power Density 99 % Occupied Bandwidth	11b Tx 11g Tx 11n-20 Tx	ANT-0	2412 MHz 2437 MHz 2462 MHz
Spurious Emission (Conducted)	11g Tx	ANT-0	2412 MHz

4.2 Configuration and peripherals

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	Monitor with Receiver	DMX958XR	PK-X0006	JVCKENWOOD	EUT
B	DC Power Supply	PW18-2ATP	19056351	TEXIO	-

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	DC(ACC,B+,GND)	1.8	Unshielded	Unshielded	-
2	Speaker (Front-L) +	0.1	Unshielded	Unshielded	-
3	Speaker (Front-R) +	0.1	Unshielded	Unshielded	-
4	Speaker (Rear-L) +	0.1	Unshielded	Unshielded	-
5	Speaker (Rear-R) +	0.1	Unshielded	Unshielded	-
6	Speaker (Front-L) -	0.1	Unshielded	Unshielded	-
7	Speaker (Front-R) -	0.1	Unshielded	Unshielded	-
8	Speaker (Rear-L) -	0.1	Unshielded	Unshielded	-
9	Speaker (Rear-R) -	0.1	Unshielded	Unshielded	-
10	P-CONT	0.1	Unshielded	Unshielded	-
11	REMOTE CONT	0.1	Unshielded	Unshielded	-
12	MUTE	0.1	Unshielded	Unshielded	-
13	ANT.CONT	0.1	Unshielded	Unshielded	-
14	ILLUMI	0.1	Unshielded	Unshielded	-
15	REVERSE	0.1	Unshielded	Unshielded	-
16	PRK SW	0.1	Unshielded	Unshielded	-
17	FM/AM ANT	0.1	Shielded	Shielded	-
18	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
6dB Bandwidth	Enough width to display emission skirts	100 kHz	300 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)
Peak Power Density	1.5 times the 6dB Bandwidth	3 kHz	9.1 kHz	Auto	Peak	Max Hold	Spectrum Analyzer *3)
Conducted Spurious Emission *4) *5)	9kHz to 150kHz	200 Hz	620 Hz	Auto	Peak	Max Hold	Spectrum Analyzer
	150kHz to 30MHz	10 kHz	30 kHz				

*1) Peak hold was applied as Worst-case measurement.
*2) Reference data
*3) Section 11.10.2 Method PKPSD (peak PSD) of "ANSI C63.10-2013".
*4) 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)
*5) 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

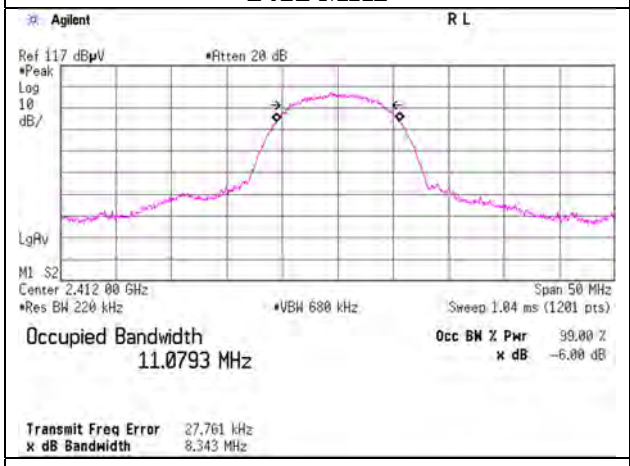
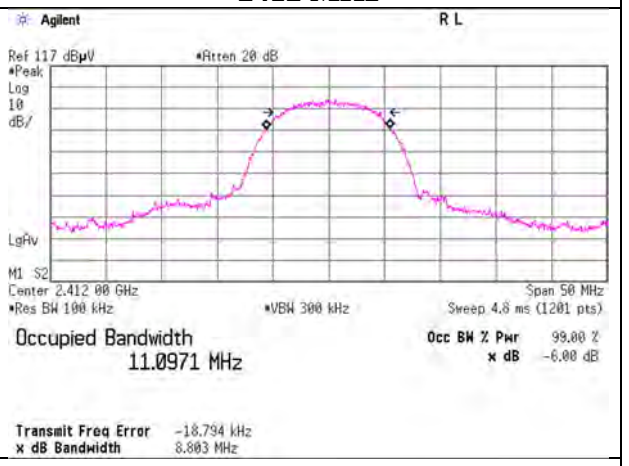
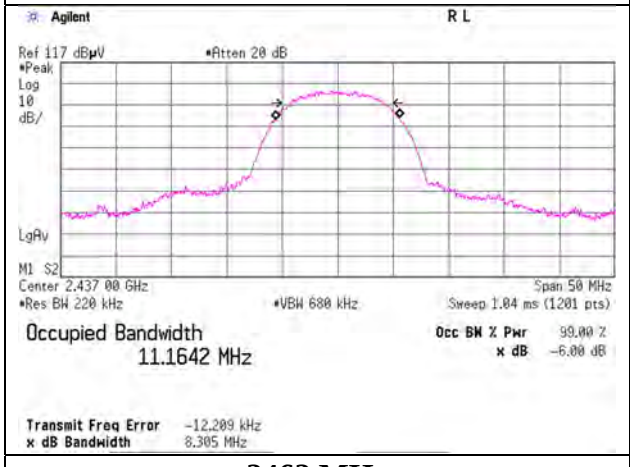
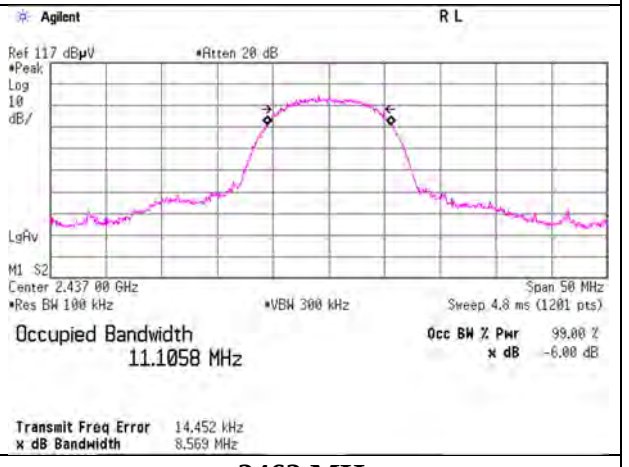
99 % Occupied Bandwidth and 6 dB Bandwidth

Report No.	14027963S-A-R1
Test place	Shonan EMC Lab. No.1 Measurement Room
Date	October 6, 2021
Temperature / Humidity	25 deg. C / 48 % RH
Engineer	Takahiro Kawakami
Mode	Tx

Mode	Frequency [MHz]	99 % Occupied Bandwidth [kHz]	6 dB Bandwidth [MHz]	Limit for 6 dB Bandwidth [MHz]
11b	2412	11079.3	8.803	> 0.5000
	2437	11164.2	8.569	> 0.5000
	2462	11118.2	8.484	> 0.5000
11g	2412	16914.8	16.474	> 0.5000
	2437	16920.4	16.470	> 0.5000
	2462	16928.6	16.475	> 0.5000
11n-20	2412	18046.4	17.778	> 0.5000
	2437	18084.7	17.751	> 0.5000
	2462	18054.1	17.720	> 0.5000

99 % Occupied Bandwidth and 6 dB Bandwidth

11b

99 % Occupied Bandwidth	6 dB Bandwidth
2412 MHz	**2412 MHz**
	
2437 MHz	**2437 MHz**
	
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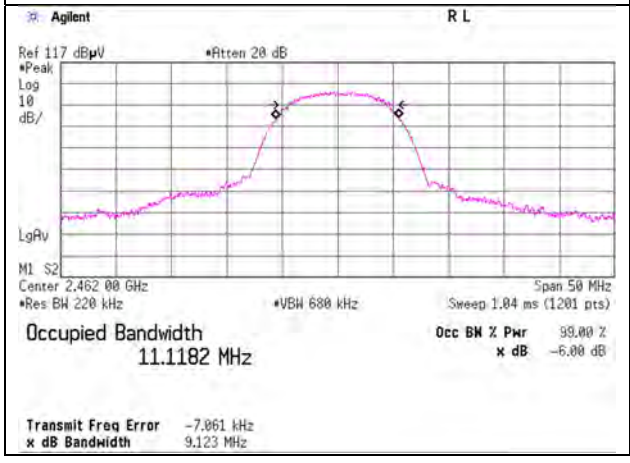
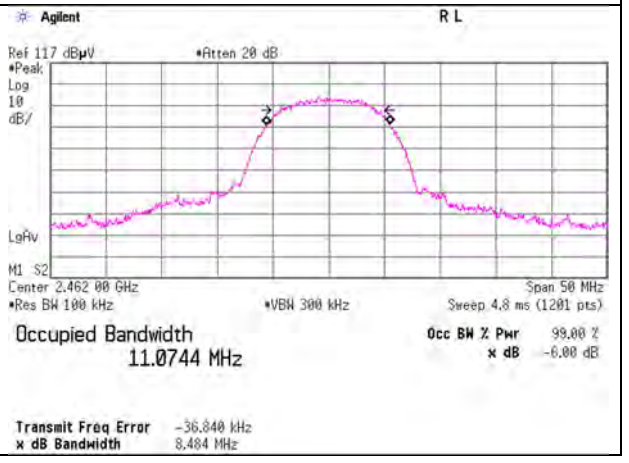
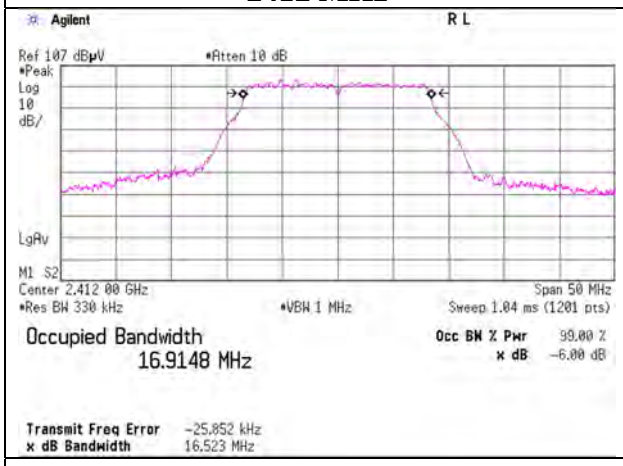
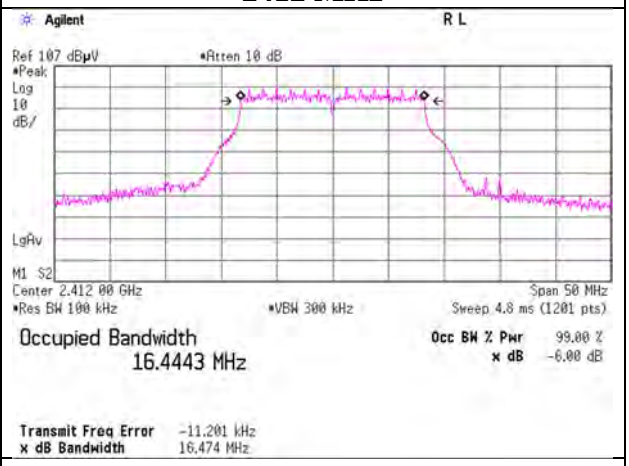
	

99 % Occupied Bandwidth and 6 dB Bandwidth

11g

99 % Occupied Bandwidth	6 dB Bandwidth
2412 MHz	2412 MHz
	
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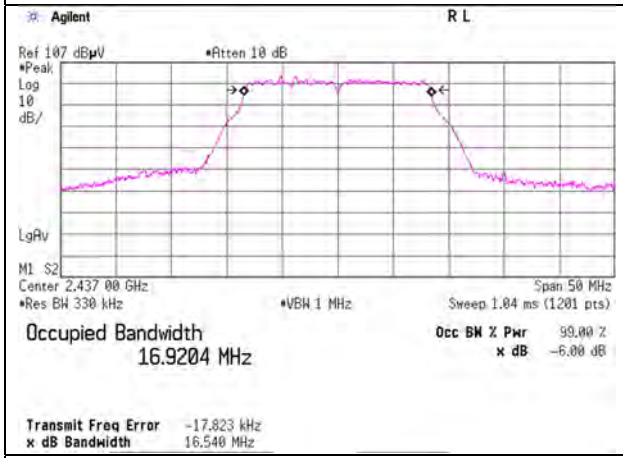	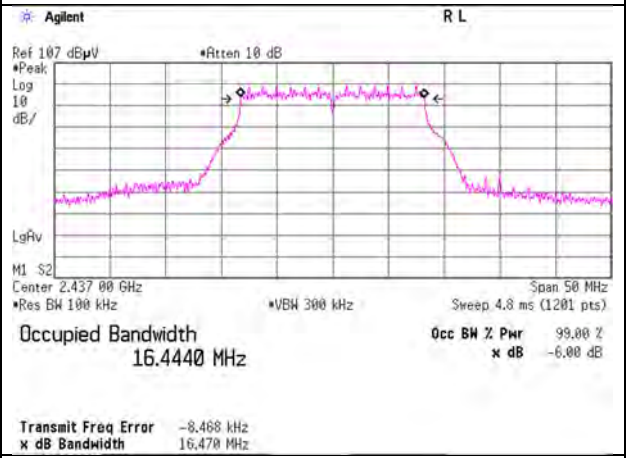
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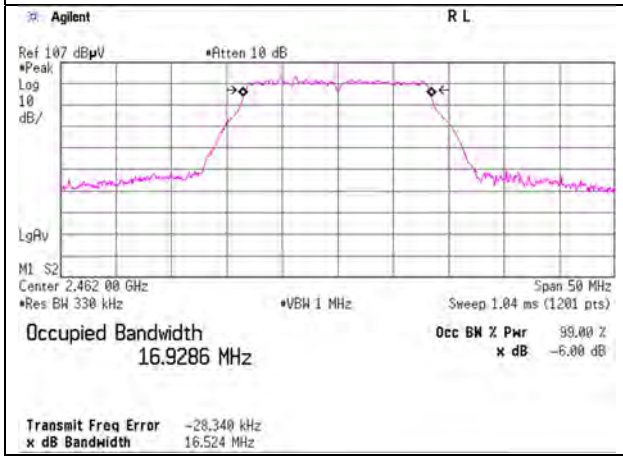
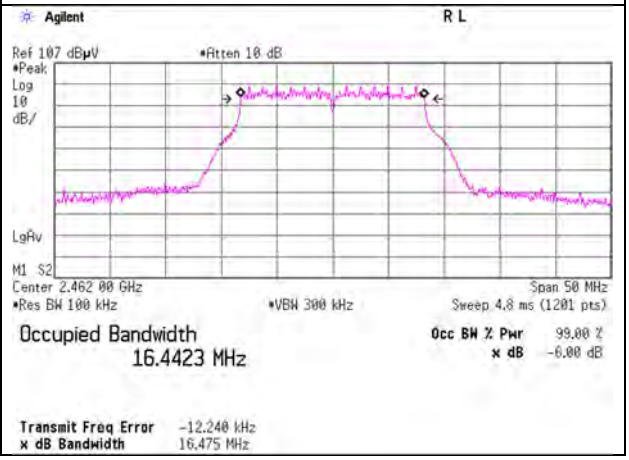
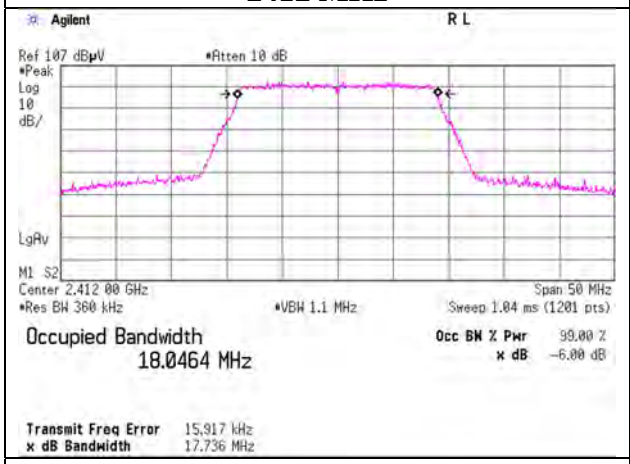
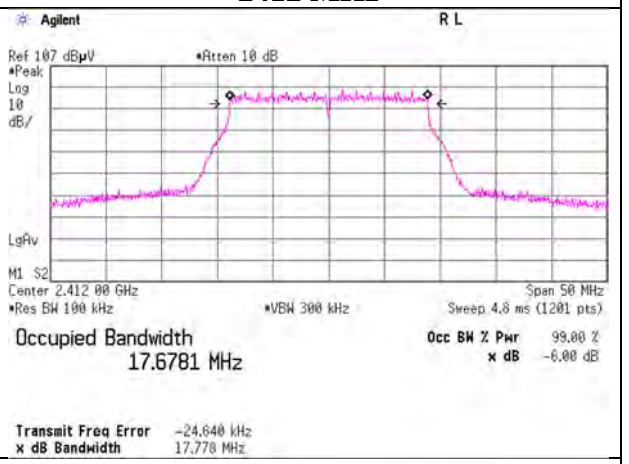
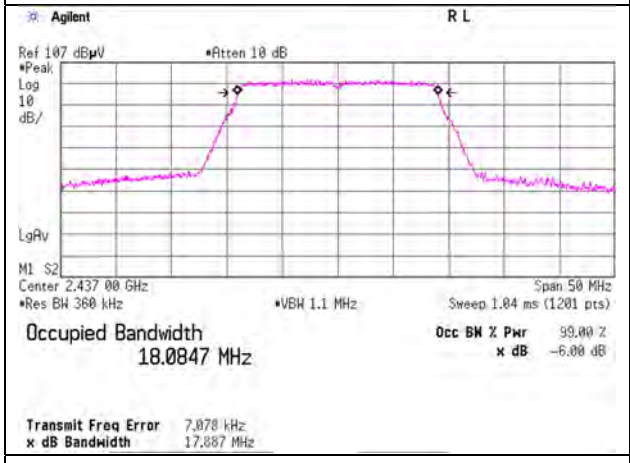
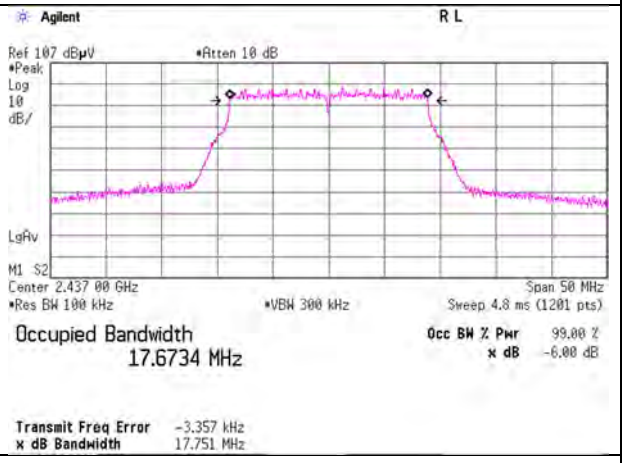
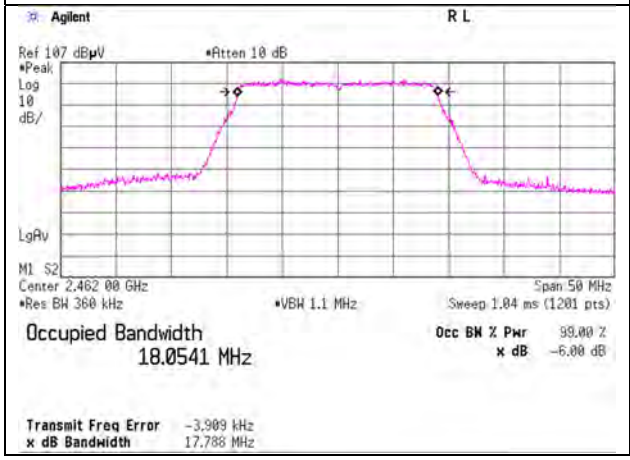
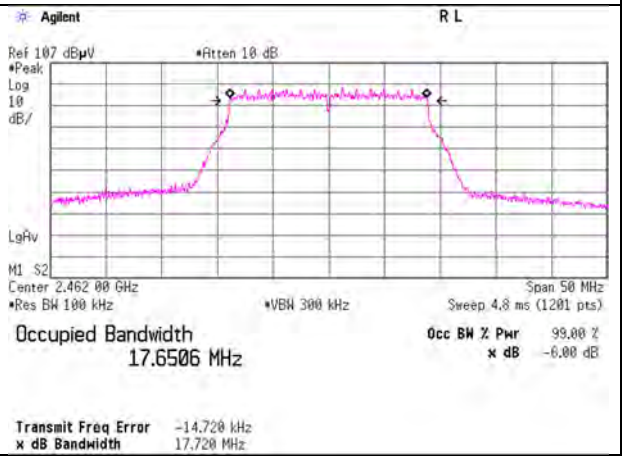
	

99 % Occupied Bandwidth and 6 dB Bandwidth

11n-20

99 % Occupied Bandwidth	6 dB Bandwidth
2412 MHz	2412 MHz
	
2437 MHz	2437 MHz
	
2462 MHz	2462 MHz
	

Maximum Peak Output Power

Report No.	14027963S-A-R1
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	October 4, 2021
Temperature / Humidity	23 deg. C / 55 % RH
Engineer	Takahiro Kawakami
Mode	Tx 11b

				Conducted Power					e.i.r.p. for RSS-247					
Freq.	Reading	Cable Loss	Atten. Loss	Result		Limit		Margin	Antenna Gain	Result		Limit		Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]	[dBi]	[dBm]	[mW]	[dBm]	[mW]	[dB]
2412	6.81	1.81	10.05	18.67	73.62	30.00	1000	11.33	-7.70	10.97	12.50	36.02	4000	25.05
2437	6.93	1.81	10.05	18.79	75.68	30.00	1000	11.21	-7.70	11.09	12.85	36.02	4000	24.93
2462	6.38	1.82	10.05	18.25	66.83	30.00	1000	11.75	-7.70	10.55	11.35	36.02	4000	25.47

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.

2437 MHz

Rate	Reading	Remark
[Mbps]	[dBm]	
1	6.73	
2	6.30	
5.5	6.27	
11	6.93	*

*: Worst Rate
All comparison were carried out on same frequency and measurement factors.

Maximum Peak Output Power

Report No.	14027963S-A-R1
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	October 4, 2021
Temperature / Humidity	23 deg. C / 55 % RH
Engineer	Takahiro Kawakami
Mode	Tx 11g

				Conducted Power					e.i.r.p. for RSS-247					
Freq.	Reading	Cable Loss	Atten. Loss	Result		Limit		Margin	Antenna Gain	Result		Limit		Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]	[dBi]	[dBm]	[mW]	[dBm]	[mW]	[dB]
2412	12.62	1.81	10.05	24.48	280.54	30.00	1000	5.52	-7.70	16.78	47.64	36.02	4000	19.24
2437	11.88	1.81	10.05	23.74	236.59	30.00	1000	6.26	-7.70	16.04	40.18	36.02	4000	19.98
2462	11.70	1.82	10.05	23.57	227.51	30.00	1000	6.43	-7.70	15.87	38.64	36.02	4000	20.15

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.

2437 MHz

Rate	Reading	Remark
[Mbps]	[dBm]	
6	11.44	
9	10.83	
12	10.46	
18	10.49	
24	11.12	
36	10.46	
48	11.88	*
54	10.15	

*: Worst Rate
All comparison were carried out on same frequency and measurement factors.

Maximum Peak Output Power

Report No.	14027963S-A-R1
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	October 4, 2021
Temperature / Humidity	23 deg. C / 55 % RH
Engineer	Takahiro Kawakami
Mode	Tx 11n-20

				Conducted Power					e.i.r.p. for RSS-247					
Freq.	Reading	Cable Loss	Atten. Loss	Result		Limit		Margin	Antenna Gain	Result		Limit		Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]	[dBi]	[dBm]	[mW]	[dBm]	[mW]	[dB]
2412	12.37	1.81	10.05	24.23	264.85	30.00	1000	5.77	-7.70	16.53	44.98	36.02	4000	19.49
2437	11.77	1.81	10.05	23.63	230.67	30.00	1000	6.37	-7.70	15.93	39.17	36.02	4000	20.09
2462	11.59	1.82	10.05	23.46	221.82	30.00	1000	6.54	-7.70	15.76	37.67	36.02	4000	20.26

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.

2437 MHz

Rate	Reading	Remark
MCS	[dBm]	
0	10.83	
1	11.05	
2	10.88	
3	10.96	
4	10.70	
5	11.77	*
6	11.01	
7	10.75	

*: Worst Rate
All comparison were carried out on same frequency and measurement factors.

Average Output Power
(Reference data for RF Exposure)

Report No.	14027963S-A-R1
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	October 4, 2021
Temperature / Humidity	23 deg. C / 55 % RH
Engineer	Takahiro Kawakami
Mode	Tx

11b **1 Mbps**

Freq.	Reading	Cable Loss	Atten. Loss	Result (Time average)		Duty factor	Result (Burst power average)	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dB]	[dBm]	[mW]
2412	2.86	1.81	10.05	14.72	29.65	0.04	14.76	29.92
2437	2.84	1.81	10.05	14.70	29.51	0.04	14.74	29.79
2462	2.42	1.82	10.05	14.29	26.85	0.04	14.33	27.10

11g **18 Mbps**

Freq.	Reading	Cable Loss	Atten. Loss	Result (Time average)		Duty factor	Result (Burst power average)	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dB]	[dBm]	[mW]
2412	0.10	1.81	10.05	11.96	15.70	0.79	12.75	18.84
2437	0.11	1.81	10.05	11.97	15.74	0.79	12.76	18.88
2462	-0.25	1.82	10.05	11.62	14.52	0.79	12.41	17.42

11n-20 **MCS 0**

Freq.	Reading	Cable Loss	Atten. Loss	Result (Time average)		Duty factor	Result (Burst power average)	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dB]	[dBm]	[mW]
2412	-0.41	1.81	10.05	11.45	13.96	0.31	11.76	15.00
2437	-0.61	1.81	10.05	11.25	13.34	0.31	11.56	14.32
2462	-0.95	1.82	10.05	10.92	12.36	0.31	11.23	13.27

Sample Calculation:
Result (Time average) = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss
Result (Burst power average) = Time average + Duty factor

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

Average Output Power
(Reference data for RF Exposure)

Report No.	14027963S-A-R1
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	October 4, 2021
Temperature / Humidity	23 deg. C / 55 % RH
Engineer	Takahiro Kawakami
Mode	Tx

2437 MHz

Mode	Rate Mbps	Reading [dBm]	Duty factor [dB]	Burst power [dBm]	Remarks
11b	1	2.84	0.04	2.88	*
	2	2.53	0.09	2.62	
	5.5	2.24	0.24	2.48	
	11	2.19	0.44	2.63	
11g	6	0.49	0.29	0.78	
	9	0.27	0.42	0.69	
	12	0.26	0.55	0.81	
	18	0.11	0.79	0.90	*
	24	-0.18	1.02	0.84	
	36	-0.72	1.40	0.68	
	48	-1.10	1.75	0.65	
	54	-1.30	1.89	0.59	

* Worst rate

Sample Calculation:

Burst power = Reading (timed average) + Duty factor

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

2437 MHz

Mode	Rate MCS	Reading [dBm]	Duty factor [dB]	Burst power [dBm]	Remarks
11n-20	0	-0.61	0.31	-0.30	*
	1	-1.05	0.58	-0.47	
	2	-1.22	0.82	-0.40	
	3	-1.37	1.04	-0.33	
	4	-1.89	1.41	-0.48	
	5	-2.12	1.71	-0.41	
	6	-2.26	1.85	-0.41	
	7	-2.38	1.98	-0.40	

* Worst rate

Sample Calculation:

Burst power = Reading (timed average) + Duty factor

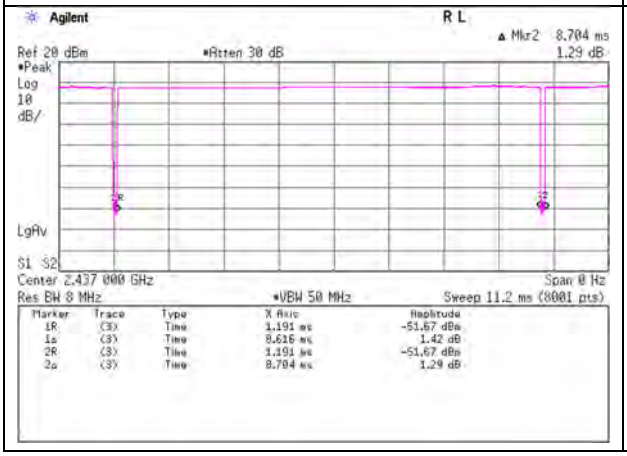
All comparison were carried out on same frequency and measurement factors.

Burst rate confirmation(Average Output Power Worst Rate)

Report No.	14027963S-A-R1
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	October 4, 2021
Temperature / Humidity	23 deg. C / 55 % RH
Engineer	Takahiro Kawakami
Mode	Tx

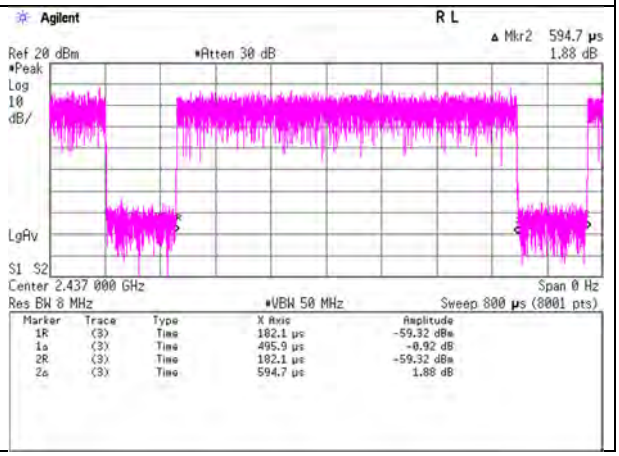
11b 1 Mbps

Tx on / (Tx on + Tx off) =	**0.990**
Tx on / (Tx on + Tx off) * 100 =	**99.0 %**
Duty factor = 10 * log (8.704 / 8.616) =	**0.04 dB**



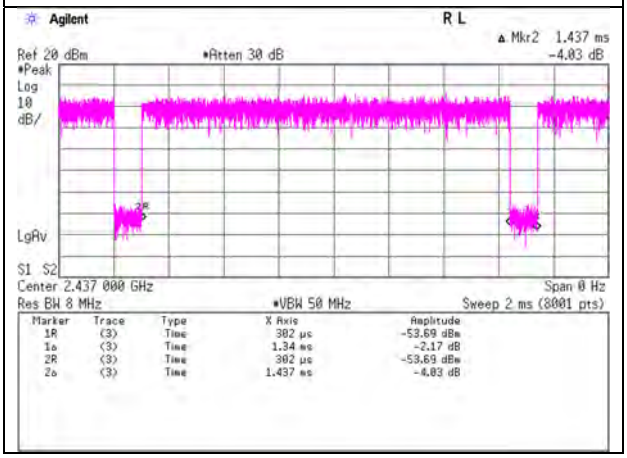
11g 18 Mbps

Tx on / (Tx on + Tx off) =	**0.834**
Tx on / (Tx on + Tx off) * 100 =	**83.4 %**
Duty factor = 10 * log (0.5947 / 0.4959) =	**0.79 dB**



11n-20 MCS 0

Tx on / (Tx on + Tx off) =	**0.932**
Tx on / (Tx on + Tx off) * 100 =	**93.2 %**
Duty factor = 10 * log (1.437 / 1.34) =	**0.31 dB**



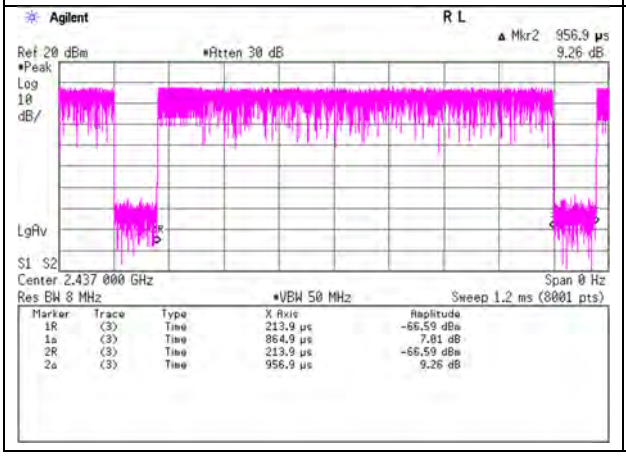
* Since the burst rate is not different between the channels, the data has been obtained on the representative channel.

Burst rate confirmation(Maximum Peak Output Power Worst Rate)

Report No.	14027963S-A-R1
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	October 4, 2021
Temperature / Humidity	23 deg. C / 55 % RH
Engineer	Takahiro Kawakami
Mode	Tx

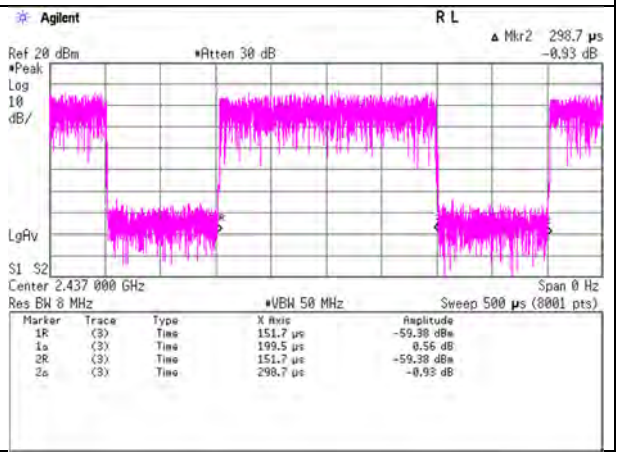
11b 11 Mbps

Tx on / (Tx on + Tx off) =	**0.904**
Tx on / (Tx on + Tx off) * 100 =	**90.4 %**
Duty factor = 10 * log (0.9569 / 0.8649) =	**0.44 dB**



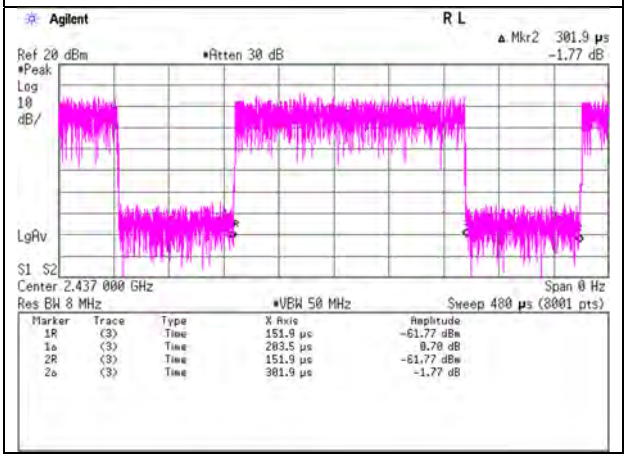
11g 48 Mbps

Tx on / (Tx on + Tx off) =	**0.668**
Tx on / (Tx on + Tx off) * 100 =	**66.8 %**
Duty factor = 10 * log (0.2987 / 0.1995) =	**1.76 dB**



11n-20 MCS 5

Tx on / (Tx on + Tx off) =	**0.674**
Tx on / (Tx on + Tx off) * 100 =	**67.4 %**
Duty factor = 10 * log (0.3019 / 0.2035) =	**1.72 dB**

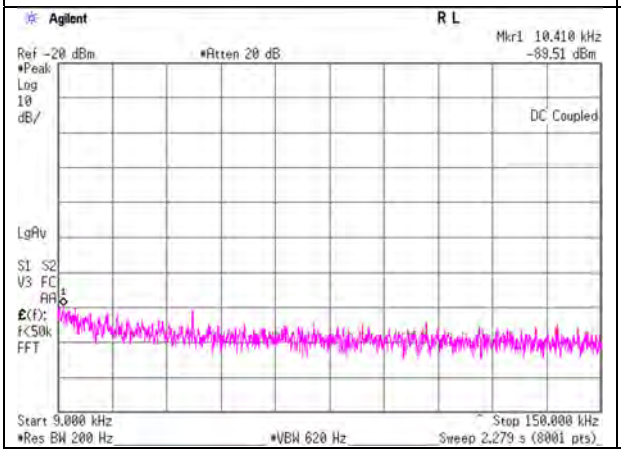


* Since the burst rate is not different between the channels, the data has been obtained on the representative channel.

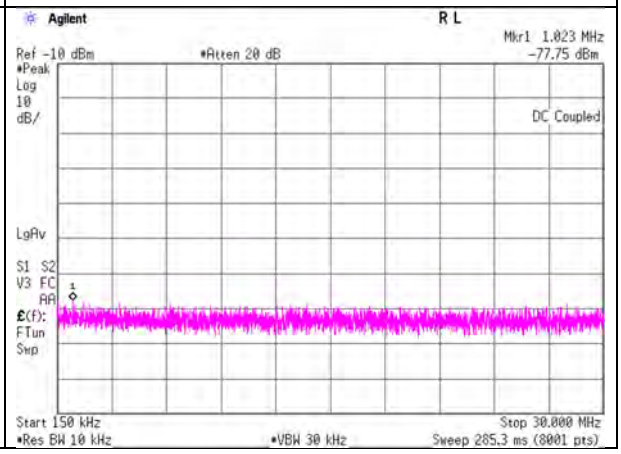
Conducted Spurious Emission

Report No.	14027963S-A-R1
Test place	Shonan EMC Lab. No.1 Measurement Room
Date	October 6, 2021
Temperature / Humidity	25 deg. C / 48 % RH
Engineer	Takahiro Kawakami
Mode	Tx 11g 2412 MHz

9 kHz - 150 kHz



150 kHz - 30 MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator Loss [dB]	Antenna Gain* [dBi]	N (Number of Output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
10.41	-89.5	0.01	9.97	2.0	1	-77.5	300	6.0	-16.3	47.2	63.5	-
1023.00	-77.8	0.02	9.97	2.0	1	-65.8	30	6.0	15.5	27.4	11.9	-

E [dBuV/m] = EIRP [dBm] - 20 log (Distance [m]) + Ground bounce [dB] + 104.8 [dBuV/m]

EIRP[dBm] = Reading [dBm] + Cable loss [dB] + Attenuator Loss [dB] + Antenna gain [dBi] + 10 * log (N)

N: Number of output

*2.0 dBi was applied to the test result based on ANSI C63.10 since antenna gain was less than 2.0 dBi.

Power Density

Report No.	14027963S-A-R1
Test place	Shonan EMC Lab. No.1 Measurement Room
Date	October 6, 2021
Temperature / Humidity	25 deg. C / 48 % RH
Engineer	Takahiro Kawakami
Mode	Tx

11b

Freq. [MHz]	Reading dBm / 3 kHz	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm / 3 kHz]	Limit [dBm / 3 kHz]	Margin [dB]
2412	-20.27	1.81	10.05	-8.41	8.00	16.41
2437	-19.22	1.81	10.05	-7.36	8.00	15.36
2462	-21.05	1.82	10.05	-9.18	8.00	17.18

11g

Freq. [MHz]	Reading dBm / 3 kHz	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm / 3 kHz]	Limit [dBm / 3 kHz]	Margin [dB]
2412	-26.42	1.81	10.05	-14.56	8.00	22.56
2437	-26.39	1.81	10.05	-14.53	8.00	22.53
2462	-26.50	1.82	10.05	-14.63	8.00	22.63

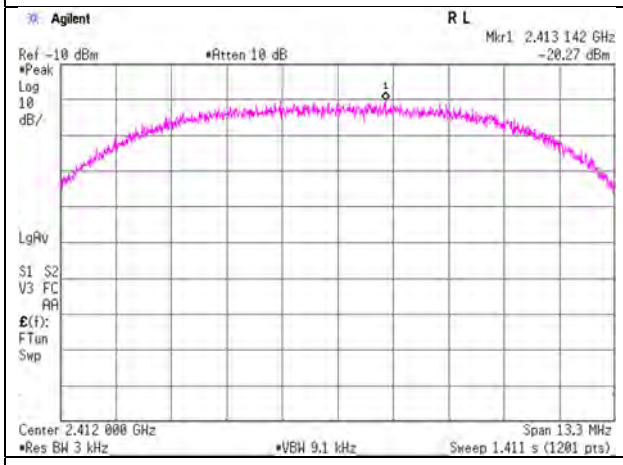
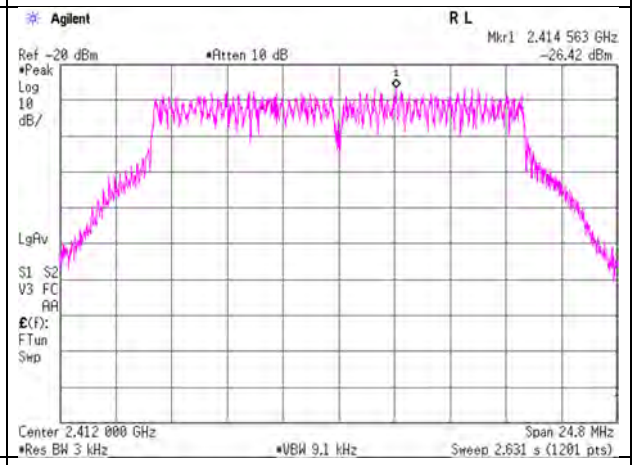
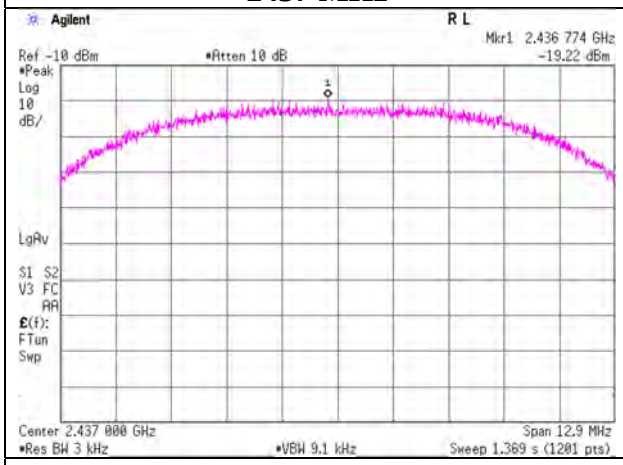
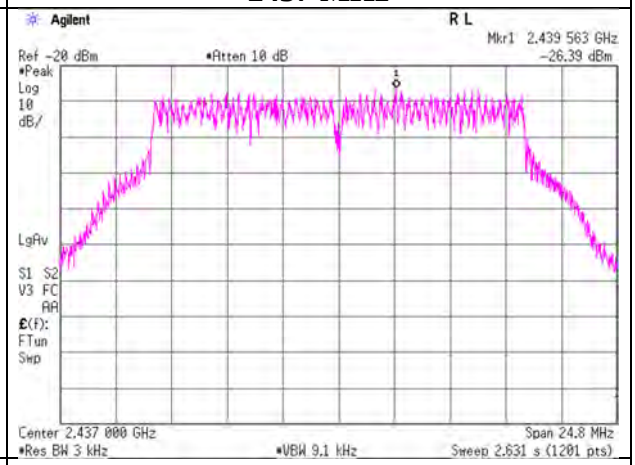
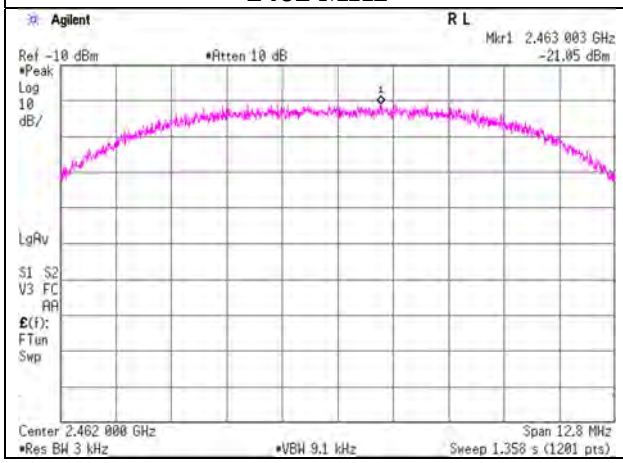
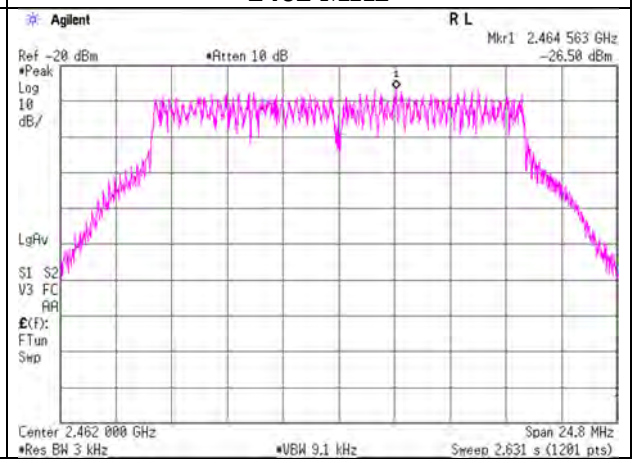
11n-20

Freq. [MHz]	Reading dBm / 3 kHz	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm / 3 kHz]	Limit [dBm / 3 kHz]	Margin [dB]
2412	-26.58	1.81	10.05	-14.72	8.00	22.72
2437	-25.53	1.81	10.05	-13.67	8.00	21.67
2462	-26.19	1.82	10.05	-14.32	8.00	22.32

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

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

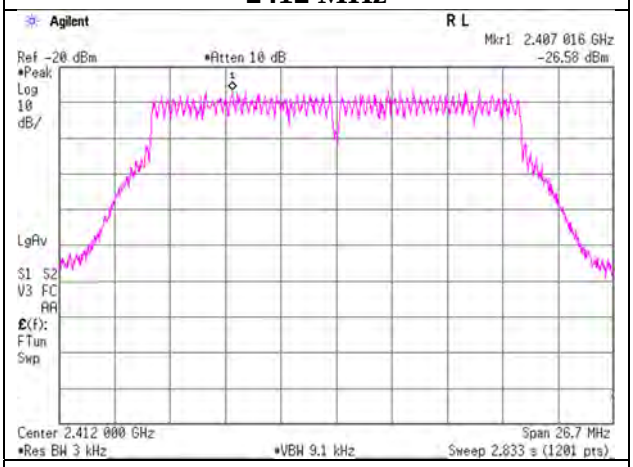
Power Density

11b	11g
2412 MHz	**2412 MHz**
	
2437 MHz	**2437 MHz**
	
2462 MHz	**2462 MHz**
	

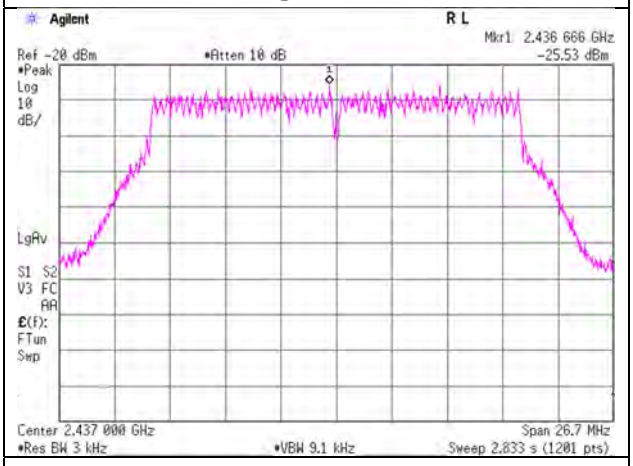
Power Density

11n-20

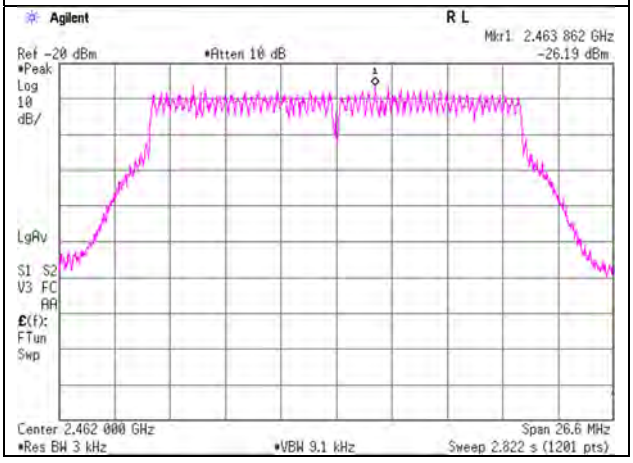
2412 MHz



2437 MHz



2462 MHz



APPENDIX 2: Test instruments

Test equipment

Test Item	Local ID	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Cal Int
AT	KTS-07	145111	Digital Tester	SANWA	PC500	7019232	2021/09/14	12
AT	KTS-08	145095	Digital Tester	SANWA	PC500	7019224	2021/04/26	12
AT	SAT10-22	204926	Attenuator	Weinschel Corp.	54A-10	-	2021/02/09	12
AT	SCC-G12	145040	Coaxial Cable	Suhner	SUCOFLEX 102	30790/2	2021/03/04	12
AT	SOS-19	175823	Humidity Indicator	CUSTOM. Inc	CTH-201	-	2020/10/01	12
AT	SOS-28	191846	Humidity Indicator	CUSTOM. Inc	CTH-201	-	2021/08/02	12
AT	SPM-07	146247	Power Meter	Keysight Technologies Inc	8990B	MY5100272	2021/05/25	12
AT	SPSS-04	146310	Power sensor	Keysight Technologies Inc	N1923A	MY5326009	2021/05/25	12
AT	SRENT-09	150461	Spectrum Analyzer	Keysight Technologies Inc	E4440A	MY46186392	2021/02/22	12
AT	SRENT-22	202830	Spectrum Analyzer	Keysight Technologies Inc	E4440A	MY48250036	2020/11/24	12
AT	STM-G6	146207	Terminator	JFW	50T-128	-	2020/11/19	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