RADIO TEST REPORT

Test Report No.: 14524536H-C-R1

Customer	**Murata Manufacturing Co., Ltd.**
Description of EUT	**Communication Module**
Model Number of EUT	**Type1VY-934**
FCC ID	**VPYLB1VY934**
Test Regulation	**FCC Part 15 Subpart E**
Test Result	**Complied (Refer to SECTION 3)**
Issue Date	**February 9, 2023**
Remarks	**DFS test only** **Client without radar detection**

Representative test engineer

T. Noguchi

Takafumi Noguchi
Engineer

Approved by

T. Shimada

Takumi Shimada
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.: 14524536H-C

This report is a revised version of 14524536H-C. 14524536H-C is replaced with this report.

Revision	Test Report No.	Date	Page Revised Contents
- (Original)	14524536H-C	November 30, 2022	-
1	14524536H-C-R1	February 9, 2023	Section 2.2: Radio Specification for WLAN (IEEE802.11b/11g/11n-20) and Bluetooth (Low Energy) -Collection of item name Antenna Gain→Antenna Type
1	14524536H-C-R1	February 9, 2023	Section 2.2: Radio Specification for Bluetooth (Low Energy) -Deletion of information for PCB Antenna

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

CONTENTS **PAGE**

SECTION 1: Customer Information

Company Name	Murata Manufacturing Co., Ltd.
Address	1-10-1 Higashikotari, Nagaokakyo-shi, Kyoto 617-8555 Japan
Telephone Number	+81-75-955-6736
Contact Person	Motoo Hayashi

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	Communication Module
Model Number	Type1VY-934
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	October 11, 2022
Test Date	November 21, 2022

2.2 Product Description

General Specification

Rating	VDD_3P3, SWREG_IN, VDD_FEM: Typ.: DC 3.3 V, Min.: DC 3.135 V, Max: DC 3.465 V VDDIO_GPIO, VDDIO_AO: Typ.: DC 3.3 V, Min.: DC 3.14 V, Max: DC 3.46 V

Radio Specification

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

Equipment Type	Transceiver
Frequency of Operation	2412 MHz to 2462 MHz
Type of Modulation	DSSS, OFDM
Antenna Type	Pattern Antenna: Chain 0 PCB Antenna: Chain 1
Antenna Gain	Pattern Antenna: 2.0 dBi PCB Antenna: 2.0 dBi to 1.4 dBi [RF Cable length: 30 mm to 315 mm]

Bluetooth (Low Energy)

Equipment Type	Transceiver
Frequency of Operation	2402 MHz to 2480 MHz
Type of Modulation	BT LE: GFSK
Antenna Type	Pattern Antenna: Chain 0
Antenna Gain	Pattern Antenna: 2.0 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 5260 MHz to 5320 MHz 5500 MHz to 5720 MHz 5745 MHz to 5825 MHz
	40 MHz Band:	5190 MHz to 5230 MHz 5270 MHz to 5310 MHz 5510 MHz to 5710 MHz 5755 MHz to 5795 MHz
	80 MHz Band:	5210 MHz 5290 MHz 5530 MHz to 5690 MHz 5775 MHz
Type of Modulation	OFDM	
Antenna Type	Pattern Antenna: Chain 0 PCB Antenna: Chain 1	
Antenna Gain	Pattern Antenna: 1.9 dBi PCB Antenna: 1.3 dBi to -1.3 dBi [RF Cable length: 30 mm to 315 mm]	

SECTION 3: Scope of Report

This report only covers DFS requirement, as specified by the following referenced procedures.

SECTION 4: Test Specification, Procedures & Results

4.1 Test Specification

Test Specification	FCC Part 15 Subpart E
Title	FCC 47CFR Part15 Radio Frequency Device Subpart E Unlicensed National Information Infrastructure Devices Section 15.407 General technical requirements

Test Specification	KDB905462 D02 UNII DFS Compliance Procedures New Rules v02
Title	COMPLIANCE MEASUREMENT PROCEDURES FOR UNLICENSED-NATIONAL INFORMATION INFRASTRUCTURE DEVICES OPERATING IN THE 5250-5350MHz AND 5470-5725MHz BANDS INCORPORATING DYNAMIC FREQUENCY SELECTION

Test Specification	KDB905462 D03 Client Without DFS New Rules v01r02
Title	U-NII CLIENT DEVICES WITHOUT RADAR DETECTION CAPABILITY

FCC Part 15.31 (e)

The EUT has the power supply regulator. However one of the input voltages to RF part doesn't go through the regulator. The stable voltage will be supplied by the end product, which will be required to have a power supply regulator. Therefore, the EUT complies with the requirement.

FCC Part 15.203/212 Antenna requirement

Chain 0: Pattern Antenna

The antenna is not removable from the EUT.
Therefore, the equipment complies with the antenna requirement of Section 15.203.

Chain 1: PCB Antenna

The EUT has a unique coupling/antenna connector (U.FL).
Therefore the equipment complies with the requirement of 15.203.

4.2 Procedures and Results

Table 1: Applicability of DFS Requirements

Requirement	Operating Mode Client without Radar Detection	Test Procedures & Limits	Deviation	Results
U-NII Detection Bandwidth	Not required	KDB905462 D02 UNII DFS Compliance Procedures New Rules v02	N/A	N/A
Initial Channel Availability Check Time	Not required	FCC15.407 (h) KDB905462 D02 UNII DFS Compliance Procedures New Rules v02 RSS-247 6.3	N/A	N/A
Radar Burst at the Beginning of the Channel Availability Check Time	Not required	FCC15.407 (h) KDB905462 D02 UNII DFS Compliance Procedures New Rules v02 RSS-247 6.3	N/A	N/A
Radar Burst at the End of the Channel Availability Check Time	Not required	FCC15.407 (h) KDB905462 D02 UNII DFS Compliance Procedures New Rules v02 RSS-247 6.3	N/A	N/A
In-Service Monitoring for Channel Move Time, Channel Closing Transmission Time	Yes	FCC15.407 (h) KDB905462 D02 UNII DFS Compliance Procedures New Rules v02 RSS-247 6.3	N/A	Complied a)
In-Service Monitoring for Non-Occupancy period	Yes *1)	FCC15.407 (h) KDB905462 D02 UNII DFS Compliance Procedures New Rules v02 RSS-247 6.3	N/A	Complied b)
Statistical Performance Check	Not required	FCC15.407 (h) KDB905462 D02 UNII DFS Compliance Procedures New Rules v02	N/A	N/A

Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0422.
*1) Although this test was not required in FCC, KDB 905462 D02, it was performed as additional test.

a) Refer to SECTION 6, clause 6.3
b) Refer to SECTION 7, clause 7.3

Table 2 DFS Detection Thresholds for Master Devices and Client Devices With Radar Detection

Maximum Transmit Power	Value (See Notes 1,2, and 3)
≥ 200 milliwatt	-64 dBm
< 200 milliwatt and power spectral density < 10dBm/MHz	-62 dBm
< 200 milliwatt that do not meet the power spectral density requirement	-64 dBm
Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna. Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response. Note 3: EIRP is based on the highest antenna gain. For MIMO devices refer to KDB Publication 662911 D01.	

Table 3 DFS Response Requirement Values

Parameter	Value
Non-occupancy period	Minimum 30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds See Note 1
Channel Closing Transmission Time	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2
U-NII Detection Bandwidth	Minimum 100 % of the U-NII 99 % transmission power bandwidth See Note 3
Note 1: Channel Move Time and the Channel Closing Transmission Time should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst. **Note 2:** The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required to facilitate a Channel move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signal will not count quiet periods in between transmissions. **Note 3:** During the U-NII Detection Bandwidth detection test, radar type 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.	

Table 4 Short Pulse Radar Test Waveform

Radar Type	Pulse Width (µs)	PRI (µs)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Number of Traials
0	1	1428	18	See Note 1	See Note 1
1	1	Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in Table 5a	Roundup{(1/360)* ($19*10^6$/PRI $_{us}$)}	60 %	30
		Test B: 15 unique PRI values randomly selected within the range of 518-3066 µs, with a minimum increment of 1 µs, excluding PRI values selected in Test A			
2	1-5	150-230	23-29	60 %	30
3	6-10	200-500	16-18	60 %	30
4	11-20	200-500	12-16	60 %	30
Aggregate (Rader Types 1-4)				80 %	120
Note 1: Short Pulse Radar Type 0 should be used for the detection bandwidth test, channel move time, and channel closing time tests.					

Table 5 Long Pulse Radar Test Waveform

Radar Type	Pulse Width (µs)	Chip Width (MHz)	PRI (µs)	Number of Pulses per *Burst*	Number of *Burst*	Minimum Percentage of Successful Detection	Minimum Number of Trials
5	50-100	5 - 20	1000-2000	1-3	8-20	80 %	30

Table 6 Frequency Hopping Radar Test Waveform

Radar Type	Pulse Width (µs)	PRI (µs)	Pulse per Hop (kHz)	Hopping Rate (kHz)	Hopping Sequence Length (ms)	Minimum Percentage of Successful Detection	Minimum Number of Trials
6	1	333	9	0.333	300	70 %	30

4.3 Addition to Standard

No addition, exclusion nor deviation has been made from the standard.

4.4 Test Location

UL Japan, Inc. Ise EMC Lab.
*A2LA Certificate Number: 5107.02 / FCC Test Firm Registration Number: 884919
ISED Lab Company Number: 2973C / CAB identifier: JP0002
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 Japan
Telephone: +81-596-24-8999

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	-	-

4.5 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.
Time Measurement uncertainty for this test was: (±) 0.012%

4.6 Test Instruments of DFS and Test Set Up

Refer to APPENDIX.

SECTION 5: Operation of EUT during testing

5.1 Operating Modes

The EUT, which is a Client Device without Radar detection capability, operates over the U-NII-2A (W53) and U-NII-2C (W56).

The channel-loading of approximately 17% or greater was used for testing, and its test data was transferred from the Master Device to the Client Device for all test configurations.

The EUT utilizes the 802.11a/n/ac architecture, with a 20MHz, 40MHz and 80MHz channel bandwidth.

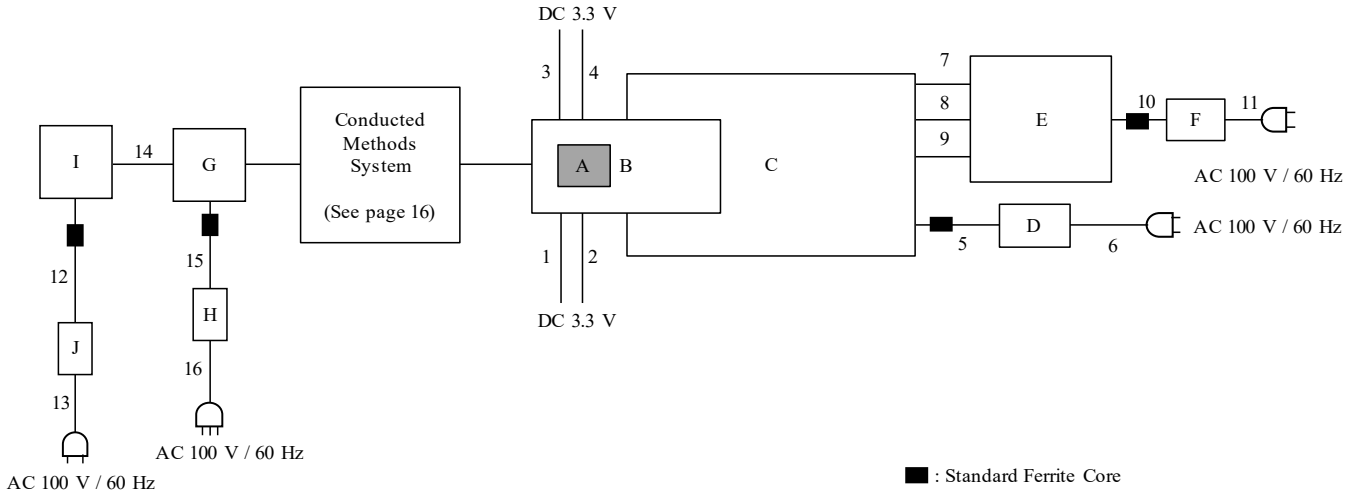
The FCC ID for the Master Device used with EUT for DFS testing is LDK102087.

The rated output power of the Master unit is >200mW(23dBm). Therefore the required interference threshold level is -64 dBm. After correction for antenna gain and procedural adjustments, the required conducted threshold at the antenna port is -64 + 1 + 0 = -63.0 dBm (threshold level + additional 1dB + antenna gain).

It is impossible for users to change DFS control, because the DFS function is written on the firmware and users cannot access it.

The EUT was set by the software as follows:
Software name: iperf
Version: 2.0.5

5.2 Configuration and Peripherals



* 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	Communication Module	Type1VY-934	No.1	Murata Manufacturing Co., Ltd.	EUT
B	Jig board	P2ML10415	No.1	Murata Manufacturing Co., Ltd.	-
C	Jig board	TDA6305	TR17472217	-	-
D	AC adapter	EA108683N-120	400-76062	EDACPOWER ELEC,	-
E	Laptop PC	CF-LX4EDHCS	5GKSA17377	Panasonic	-
F	AC adapter	CF-AA62J2C	64B2CM114703755 B	Panasonic	-
G	WLAN access point	AIR-CAP3702E-A-K9	FTX182276QC	Cisco Systems	-
H	AC Adaptor	AA25480L	ALD030406GR	Cisco Systems	-
I	Laptop PC	CF-N8HWCDPS	0BKSA08723	Panasonic	-
J	AC Adapter	CF-AA6372B	6372BM409X18054 B	Panasonic	-

List of Cables Used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	DC Cable	0.8	Unshielded	Unshielded	-
2	DC Cable	0.8	Unshielded	Unshielded	-
3	DC Cable	0.8	Unshielded	Unshielded	-
4	DC Cable	0.8	Unshielded	Unshielded	-
5	DC Cable	1.0	Unshielded	Unshielded	-
6	AC Cable	1.0	Unshielded	Unshielded	-
7	LAN Cable	2.0	Unshielded	Unshielded	-
8	USB Cable	1.0	Shielded	Shielded	-
9	USB Cable	2.0	Shielded	Shielded	-
10	DC Cable	1.0	Unshielded	Unshielded	-
11	AC Cable	1.0	Unshielded	Unshielded	-
12	DC Cable	1.0	Unshielded	Unshielded	-
13	AC Cable	0.8	Unshielded	Unshielded	-
14	LAN Cable	3.0	Unshielded	Unshielded	-
15	DC Cable	1.9	Unshielded	Unshielded	-
16	AC Cable	2.1	Unshielded	Unshielded	-

5.3 Test and Measurement System

System Overview

The measurement system is based on a conducted test method.

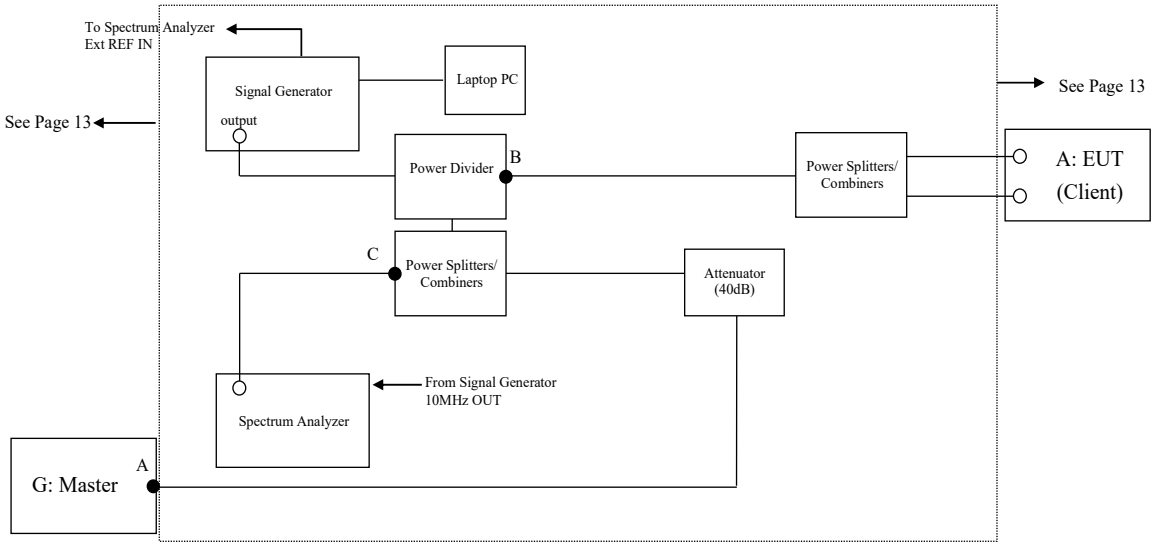
The software selects waveform parameters from within the bounds of the signal type on a random basis using uniform distribution. The short pulse types 1, 2, 3, and 4, the long pulse type 5, and the frequency hopping type 6 parameters are randomized at run-time.

The signal monitoring equipment consists of a spectrum analyzer with the capacity to display 8001 bins on the horizontal axis. A time-domain resolution of 2 ms/bin is achievable with a 16 second sweep time, meeting the 10 seconds short pulse reporting criteria. The aggregate ON time is calculated by multiplying the number of bins above a threshold during a particular observation period by the dwell time per bin, with the analyzer set to peak detection.

Frequency Hopping Radar Waveform Generating Subsystem

The first 100 frequencies are selected out of the hopping sequence of the randomized 475 hop frequencies.
Only a *Burst* that has the frequency falling within the receiver bandwidth of the tested U-NII device is selected among those frequencies. (Frequency-domain simulation). The radar waveform generated at the start time of the selected *Burst* (Time-domain simulation) is download to the Signal Generator.
If all of the randomly selected 100 frequencies do not fall within the receiver bandwidth of the U-NII device, the radar waveform is not used for the test.

Conducted Methods System Block Diagram



Measurement System Frequency Reference

Lock the signal generator and the spectrum analyzer to the same reference sources as follows: Connect the 10 MHz OUT on the signal generator to the EXT REF IN on the spectrum analyzer and set the spectrum analyzer Ext to On.

System Calibration

Step 1: Set the system as shown in Figure 3 of KDB905462 D02 7.2.2.

Step 2: Adjust each attenuator to fulfill the following three conditions:
- WLAN can be communicated, and
- Rader detection threshold level is bigger than Client Device traffic level on the spectrum analyzer, and
- Master Device traffic level is not displayed on the spectrum analyzer.

Step 3: Terminate 50 ohm at B and C points, and connect the spectrum analyzer to the point A. (See the figure on page 16)
At the point A, adjust the signal generator and spectrum analyzer to the center frequency of the channel to be measured.
Download the applicable radar waveforms to the signal generator. Select the radar waveform, trigger a burst manually and measure the amplitude on the spectrum analyzer. Readjust the amplitude of the signal generator as required so that the peak level of the waveform is at a displayed level equal to the required or desired interference detection threshold.
Separate signal generator amplitude settings are determined as required for each radar type.

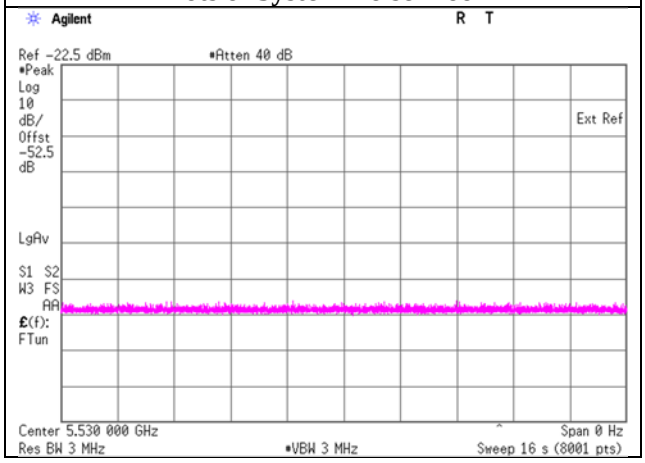
Step 4: Without changing any of the instrument settings, restore the system setting to Step 2 and adjust the Reference Level Offset of the spectrum analyzer to the level at Step 3.

By taking the above steps 1 to 4, the spectrum analyzer displays the level of the signal generator as received at the antenna ports of the Master Device.

See Clause 5.4 for Plots of Noise, Rader Waveforms, and WLAN signals.

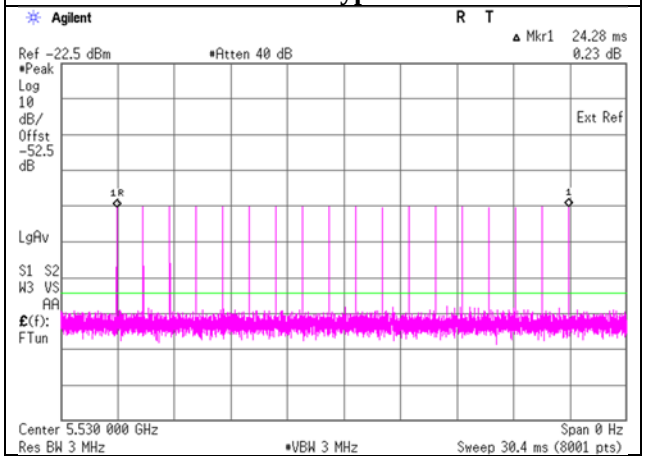
5.4 Plots of Noise, Rader Waveforms, and WLAN Signals

Plots of System Noise Floor



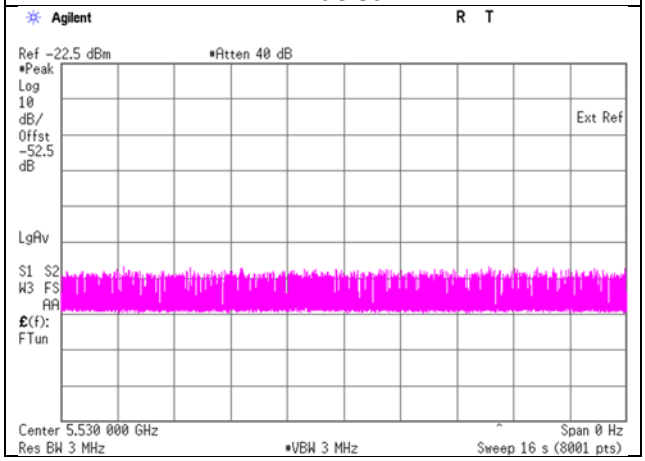
Plots of Radar Waveforms

Rader Type 0



Plots of WLAN Traffic

11ac-80



SECTION 6: Channel Move Time, Channel Closing Transmission Time

6.1 Operating Environment

Test place	Ise EMC Lab.No.8 Measurement Room
Date	November 21, 2022
Temperature/ Humidity	22 deg. C / 54 % RH
Engineer	Takafumi Noguchi
Mode	11ac-80

6.2 Test Procedure

Transmit the data from the Master Device to the Client Device on the test Channel for the entire period of the test. The Radar Waveform generator sends a Burst of pulses for one of the Short Pulse Radar Types 0 at levels defined , on the Operating Channel. An additional 1 dB is added to the radar test signal to ensure it is at or above the DFS Detection Threshold, accounting for equipment variations/errors.
Observe the transmissions of the EUT at the end of the radar Burst on the Operating Channel for duration greater than 10 seconds.

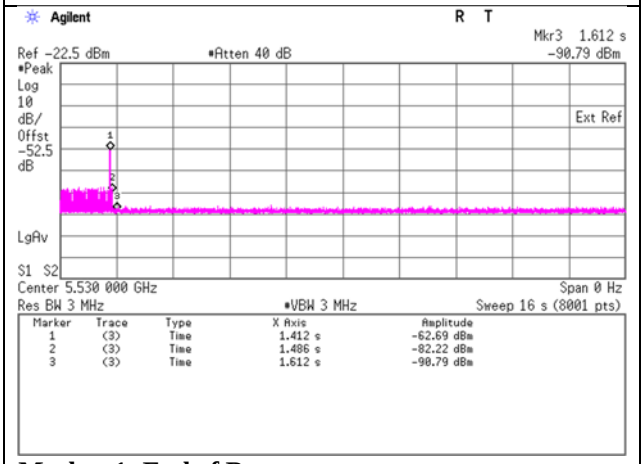
6.3 Test Data

11ac-80

Test Item	Unit	Measurement Time	Limit	Results
Channel Move Time *1)	[sec]	0.074	10.000	Pass
Channel Closing Transmission Time *2)	[msec]	0	60	Pass

*1) Channel Move Time is calculated as follows:
(Channel Move Time) = (End of Transmission) - (End of Burst) = 1.486-1.412
*2) Channel Closing Transmission Time is calculated from (End of Burst + 200msec) to (End of Burst + 10sec)
(Channel Closing Transmission Time) = (Number of analyzer bins showing transmission) × (dwell time per bin)
= 0 × 2 [msec]

Radar Type 0
11ac-80



Marker 1: End of Burst
Marker 2: End of Transmission
Marker 3: End of Burst + 200 ms

6.4 Test Result

Test result: Pass

SECTION 7: Non-Occupancy Period

7.1 Operating Environment

Test place	Ise EMC Lab.No.8 Measurement Room
Date	November 21, 2022
Temperature/ Humidity	22 deg. C / 54 % RH
Engineer	Takafumi Noguchi
Mode	11ac-80

7.2 Test Procedure

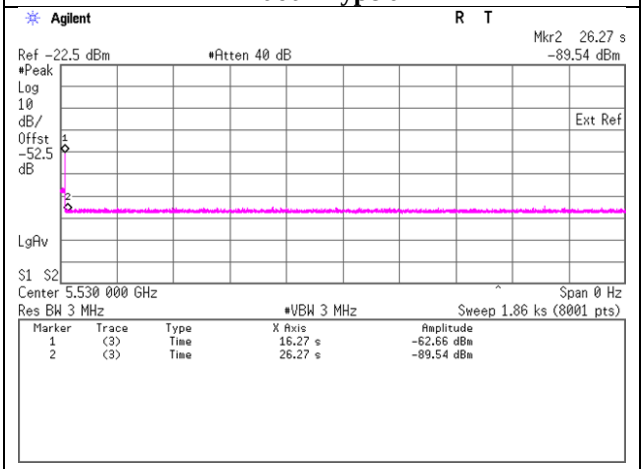
The following two tests are performed:

Transmit the data from the Master Device to the Client Device on the test Channel for the entire period of the test. The Radar Waveform generator sends a Burst of pulses for the Radar Types 0 at levels defined on the Operating Channel. An additional 1 dB is added to the radar test signal to ensure it is at or above the DFS Detection Threshold, accounting for equipment variations/errors.
Observe the transmissions of the EUT after the Channel Move Time on the Operating Channel for duration greater than 30 minutes.

7.3 Test Data

Non-Occupancy Period

Radar Type 0



Marker 1 : End of Burst
Marker 2 : End of Burst + 10s

7.4 Test Result

Test Result: Pass

APPENDIX 1: Test Instruments

Test Equipment

Test Item	Local ID	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Cal Int
DFS	MOS-28	141567	Thermo-Hygrometer	CUSTOM. Inc	CTH-201	0008	01/10/2022	12
DFS	MMM-17	141557	DIGIITAL HiTESTER	HIOKI E.E. CORPORATION	3805	70900530	01/16/2022	12
DFS	MSA-13	141900	Spectrum Analyzer	Keysight Technologies Inc	E4440A	MY46185823	09/27/2022	12
DFS	MSG-18	141898	Signal Generator	Keysight Technologies Inc	N5182B	MY56200177	11/07/2022	12
DFS	MCC-244	197219	Microwave cable	Huber+Suhner	SF126E/11PC35/ 11PC35/2000MM	536999/126E	03/17/2022	12
DFS	MCC-191	142378	Microwave Cable	Junkosha	MWX-221-02000DMSDMS	1507S110	-	-
DFS	MCC-150	142344	Microwave Cable	Junkosha	MWX221-01000AMSAMS	1304S247	-	-
DFS	MCC-138	141410	Microwave cable	Huber+Suhner	SUCOFLEX 102	37953/2	09/11/2022	12
DFS	MCC-189	142376	Microwave Cable	Junkosha	MWX-221-02000DMSDMS	1507S108	-	-
DFS	MCC-151	142345	Microwave Cable	Junkosha	MWX221-01000AMSAMS	1304S248	-	-
DFS	MCC-152	142346	Microwave Cable	Junkosha	MWX221-01000AMSAMS	1304S249	-	-
DFS	MPSC-06	142735	Power Splitters/Combiners	Pasternack Enterprises	ZFRSC-123-S+	ZFRSC-123-00231	-	-
DFS	MPSC-01	141820	Power splitters/Combiners	Mini-Circuits	ZFSC-2-2500	0124	09/30/2022	12
DFS	MPSC-04	141821	Power Splitters/Combiners	Mini-Circuits	ZFSC-2-10G	0326	09/12/2022	12
DFS	COTS-MDFS-03	170949	Signal Studio for DFS Radar Profiles	EMC Instruments Corporation	N7607B	-	-	-
DFS	MAT-101	194879	Attenuator	Keysight Technologies Inc	8495A / 8495B	MY42150956 / MY42147424	-	-

***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.**

***1) Signal generator is only used to generate radar test signal, and the wave form is confirmed with spectrum analyzer every time before the test.**

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:
DFS: Dynamic Frequency Selection