RADIO TEST REPORT

Test Report No. : 13680494H-A

Applicant	:	**MITSUBISHI ELECTRIC CORPORATION SANDA WORKS**
Type of EUT	:	**Display Audio**
Model Number of EUT	:	**NR-000**
FCC ID	:	**UJHNR000**
Test regulation	:	**FCC Part 15 Subpart E: 2021 (DFS test only) *Client without radar detection**
Test Result	:	**Complied (Refer to SECTION 3.2)**

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 standard.
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. Ise 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.

Date of test: January 26, 2021

Representative test engineer:
T. Noguchi
Takafumi Noguchi
Engineer
Consumer Technology Division

Approved by:
T. Takayama
Tsubasa Takayama
Leader
Consumer Technology Division

CERTIFICATE 5107.02

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

UL Japan, Inc.
Ise EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8999
Facsimile : +81 596 24 8124

REVISION HISTORY

Original Test Report No.: 13680494H-A

Revision	Test report No.	Date	Page revised	Contents
- (Original)	13680494H-A	February 17, 2021	-	-

UL Japan, Inc.
Ise EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8999
Facsimile : +81 596 24 8124

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

CONTENTS **PAGE**

SECTION 1: Customer information

Company Name	:	MITSUBISHI ELECTRIC CORPORATION SANDA WORKS
Address	:	2-3-33, Miwa, Sanda-city, Hyogo, 669-1513, Japan
Telephone Number	:	+81-79-559-3623
Facsimile Number	:	+81-79-559-3875
Contact Person	:	Kazuyoshi Otsuka

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	:	Display Audio
Model Number	:	NR-000
Serial Number	:	Refer to SECTION 4.2
Rating	:	DC 12.0 V
Receipt Date	:	January 26, 2021
Country of Mass-production	:	Thailand
Condition	:	Production prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification	:	No Modification by the test lab

2.2 Product Description

Model: NR-000 (referred to as the EUT in this report) is a Display Audio.

General Specification

Clock frequency(ies) in the system : 900 MHz (Radio part: 26 MHz)

Radio Specification

Radio Type : Transceiver
Power Supply (inner) : DC 3.3 V / DC 1.8 V

Radio Specification

	IEEE802.11b	IEEE802.11g/n (20 M band)	IEEE802.11a/n (20 M band)	IEEE802.11n (40 M band)
Frequency of operation	2412 MHz -2472 MHz	2412 MHz - 2472 MHz	5180 MHz - 5240 MHz 5260 MHz - 5320 MHz 5500 MHz - 5700 MHz 5745 MHz - 5825 MHz	5190 MHz - 5230 MHz 5270 MHz - 5310 MHz 5510 MHz - 5670 MHz 5755 MHz - 5795 MHz
Type of modulation	DSSS (CCK, DQPSK, DBPSK)	OFDM-CCK (64QAM, 16QAM, QPSK, BPSK)	OFDM (64QAM, 16QAM, QPSK, BPSK)	
Channel spacing	5 MHz		20 MHz	40 MHz
Antenna type	Inverted F Antenna			
Antenna Gain	0.29 dBi		W52, W53 band: 3.6 dBi W56 band: 2.17 dBi	

	GPS/GLONASS	Bluetooth Ver.3.0 with EDR function
Frequency of operation	GPS: 1575.42 MHz GLONASS: 1597.55 MHz - 1605.89 MHz	2402 MHz - 2480 MHz
Type of modulation	GPS: BPSK GLONASS: BPSK	FHSS (GFSK, π/4-DQPSK, 8-DPSK)
Channel spacing	GLONASS: 0.5625 MHz	1 MHz
Antenna type	Inverted F Antenna	Inverted F Antenna
Antenna Gain	0 dBi	0.29 dBi

* This test report applies for WLAN (5 GHz band) part.

2.3 Variant model

This model has Internal Amplifier model and External Amplifier model.

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 FCC Part 15 final revised on January 12, 2021 and effective February 11, 2021 * The revision does not affect the test result conducted before its effective date.
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 15.31 (e) / Supplied Voltage Information
The EUT provides stable voltage (DC 3.3 V / DC 1.8 V) 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 vehicle. Therefore, the equipment complies with the antenna requirement of Section 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 *	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.

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

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.

*Although this test was not required in FCC, KDB 905462 D02, it was performed as additional test.

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 (µsec)	PRI (µsec)	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 $_{usec}$)}	60 %	30
		Test B: 15 unique PRI values randomly selected within the range of 518-3066 µsec, with a minimum increment of 1 µsec, 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 (µsec)	Chip Width (MHz)	PRI (µsec)	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 (µsec)	PRI (µsec)	Pulse per Hop (kHz)	Hopping Rate (kHz)	Hopping Sequence Length (msec)	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: 199967
ISED Lab Company Number: 2973C / CAB identifier: JP0002
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone: +81 596 24 8999, Facsimile: +81 596 24 8124

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.11 measurement room	6.2 x 4.7 x 3.0	4.8 x 4.6	-	-

* Size of vertical conducting plane (for Conducted Emission test) : 2.0 x 2.0 m for No.1, No.2, No.3, and No.4 semi-anechoic chambers and No.3 and No.4 shielded rooms.

4.5 Uncertainty

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 W53 and W56 Band.

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 architecture, with a 20MHz and 40MHz channel bandwidth.

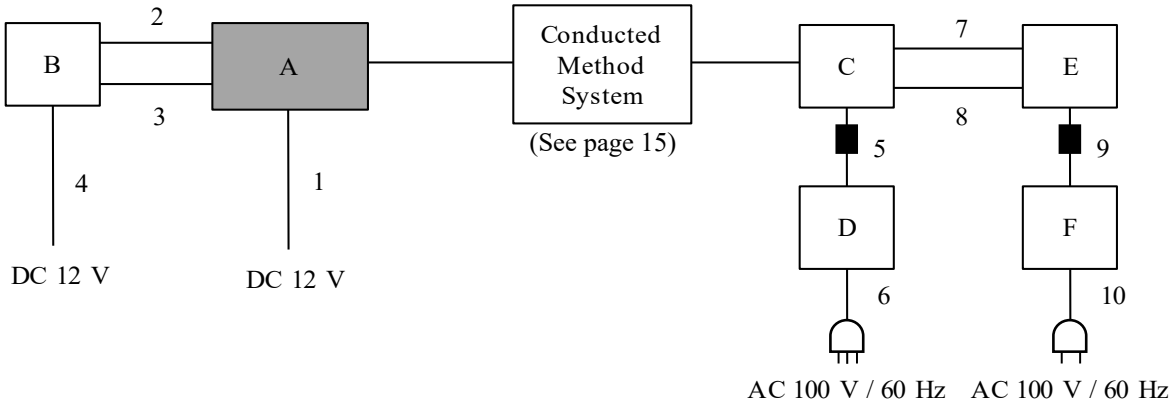
The FCC ID for the Master Device used with EUT for DFS testing is LDK102087.

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: ExPing
Version: 1.32b

5.2 Configuration and peripherals



Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Display Audio	NR-000	90ZNU095	MITSUBISHI ELECTRIC CORPORATION	EUT
B	Display	39710-TBAW-A510-M1	10	LG	-
C	Wireless LAN access point	AIR-CAP3702E-A-K9	FTX182276QN	Cisco Systems	FCC ID : LDK102087
D	AC Adapter	AA25480L	ALD02510GYT	Cisco Systems	-
E	Laptop PC	CF-N8HWCDPS	0BKSA08723	Panasonic	-
F	AC Adapter	CF-AA6372B	6372BM409X18054B	Panasonic	-

List of cables used

No.	Name	Length (m)	Shield	
			Cable	Connector
1	DC Cable	1.0	Unshielded	Unshielded
2	Display Cable	1.0	Shielded	Shielded
3	Signal Cable	1.0	Unshielded	Unshielded
4	DC Cable	1.5	Unshielded	Unshielded
5	DC Cable	1.8	Unshielded	Unshielded
6	AC Cable	2.0	Unshielded	Unshielded
7	LAN Cable	1.0	Unshielded	Unshielded
8	Console Cable	2.4	Shielded	Shielded
9	DC Cable	1.0	Unshielded	Unshielded
10	AC Cable	0.8	Unshielded	Unshielded

5.3 Test and Measurement System

SYSTEM OVERVIEW

The measurement system is based on a conducted test method.

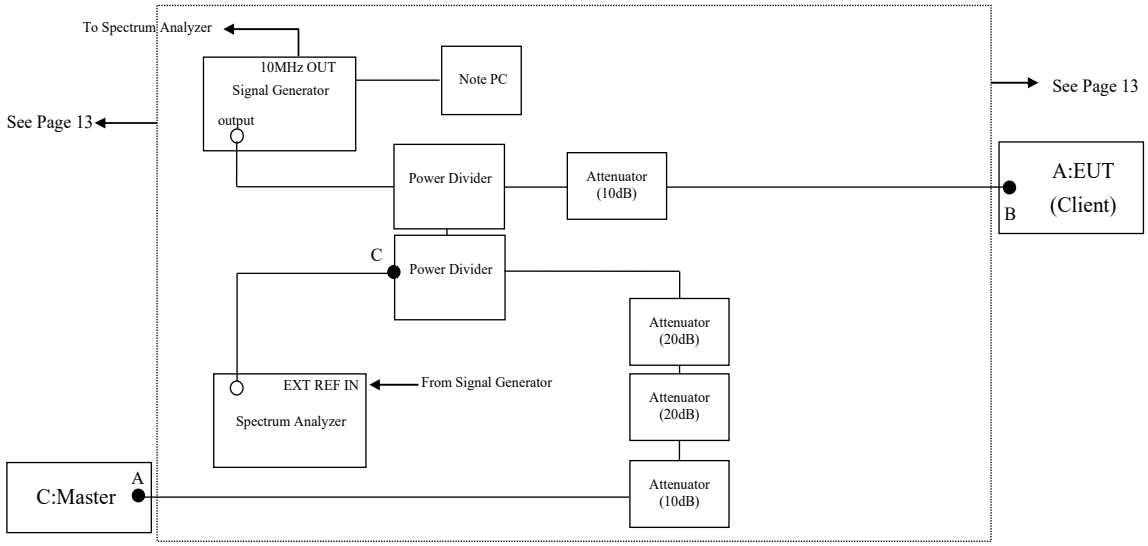
The software selects waveform parameters from within the bounds of the signal type on a random basis using uniform distribution. The short pulse types 1, 2, 3, and 4, the long pulse type 5, and the frequency hopping type 6 parameters are randomized at run-time.

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 msec/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 DIAGRM



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 15)
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.

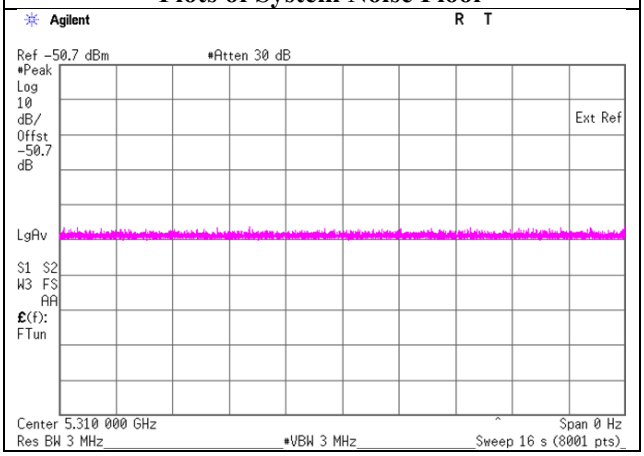
Step 4: Without changing any of the instrument settings, restore the system setting to Step 2 and adjust the Reference Level Offset of the spectrum analyzer to the level at Step 3.

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.

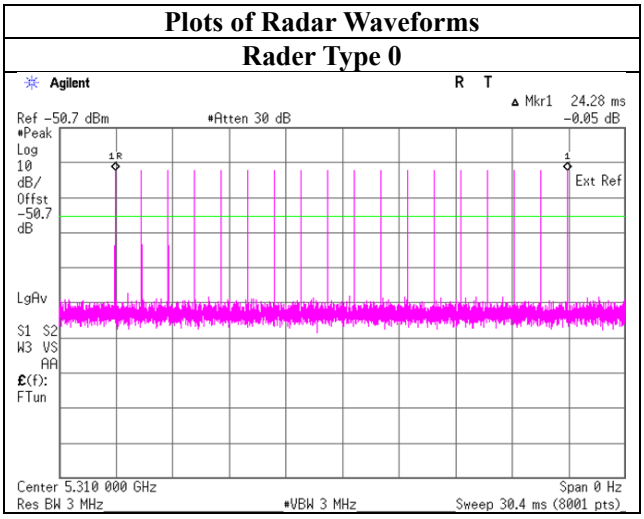
5.4 Plots of Noise, Rader Waveforms, and WLAN signals

Plots of System Noise Floor



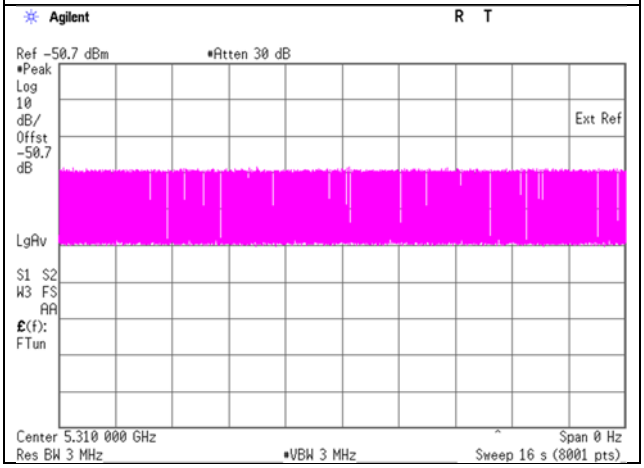
Plots of Radar Waveforms

Rader Type 0



Plots of WLAN Traffic

11n-40



SECTION 6: Channel Move Time, Channel Closing Transmission Time

6.1 Operating environment

Test place	Ise EMC Lab.No.6 Measurement Room
Date	01/26/2021
Temperature/ Humidity	22deg. C / 39% RH
Engineer	Takafumi Noguchi
Mode	11n-40

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.

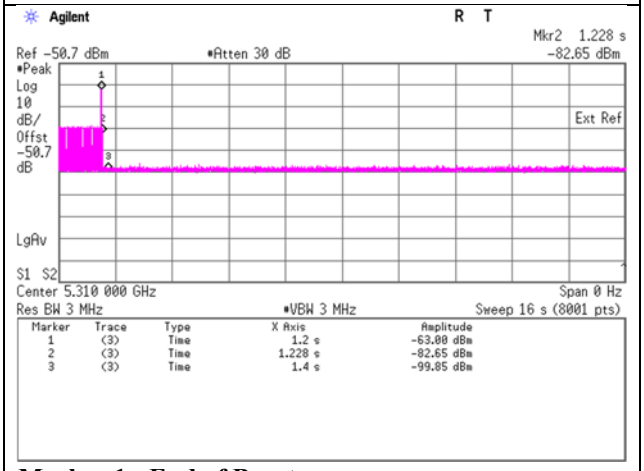
6.3 Test data

11n-40

Test Item	Unit	Measurement Time	Limit	Results
Channel Move Time *1)	[sec]	0.028	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) = 1.228-1.2
*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
11n-40



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

6.4 Test result

Test result: Pass

SECTION 7: Non-Occupancy Period

7.1 Operating environment

Test place	Ise EMC Lab.No.6 Measurement Room
Date	01/26/2021
Temperature/ Humidity	22deg. C / 39% RH
Engineer	Takafumi Noguchi
Mode	11n-40

7.2 Test Procedure

The following two tests are performed:

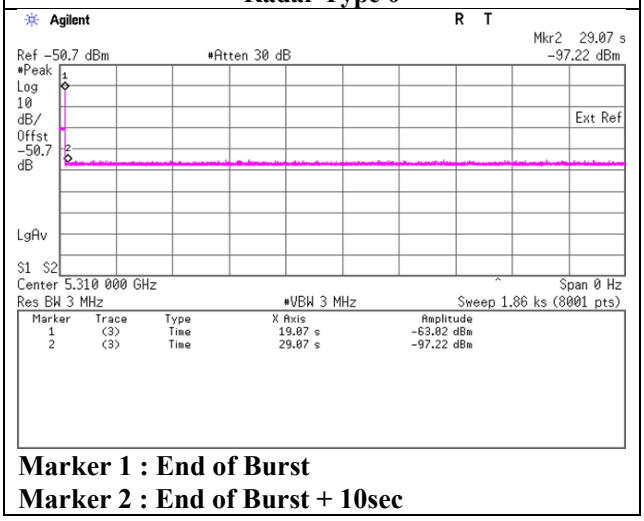
1). Transmit the data from the Master Device to the Client Device on the test Channel for the entire period of the test. The Radar Waveform generator sends a Burst of pulses for one of the Radar Types 0 at levels defined on the Operating Channel. An additional 1 dB is added to the radar test signal to 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.

2). Transmit the data from the Master Device to the Client Device on the test Channel for the entire period of the test. Observe the transmissions of the EUT on the Operating Channel for duration greater than 30 minutes after the Master Device is shut off.

7.3 Test data

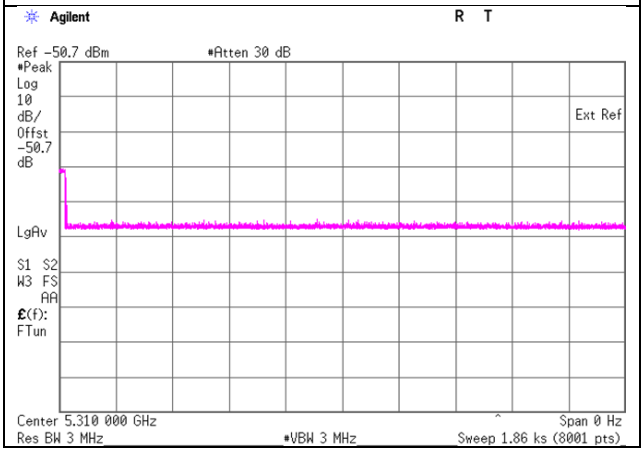
Non-Occupancy Period

Radar Type 0



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

Master is shut off



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-14	141561	Thermo-Hygrometer	CUSTOM. Inc	CTH-201	1401	2021/01/15	12
DFS	MSG-18 *1)	141898	Signal Generator	Keysight Technologies Inc	N5182B	MY56200177	2020/11/05	12
DFS	MSA-14	141901	Spectrum Analyzer	Keysight Technologies Inc	E4440A	MY48250080	2020/12/18	12
DFS	MCC-190	142377	Microwave Cable	Junkosha	MWX-221-02000DMSDMS	1507S109	-	-
DFS	MCC-191	142378	Microwave Cable	Junkosha	MWX-221-02000DMSDMS	1507S110	-	-
DFS	MCC-244	197219	Microwave cable	HUBER+SUNER	SF126E/11PC35/11PC35/2000MM	536999/126E	2020/03/23	12
DFS	MCC-245	197220	Microwave cable	HUBER+SUNER	SF126E/11PC35/11PC35/2000MM	537003/126E	2020/03/23	12
DFS	MAT-23	141361	Attenuator(10dB) 1-18GHz	Orient Microwave	BX10-0476-00	-	2020/04/21	12
DFS	MAT-90	141223	Attenuator	Weinschel Associates	WA56-10	56100306	2020/05/25	12
DFS	MAT-61	142304	Attenuator(20dB)	Suhner	6820.19.A	-	-	-
DFS	MAT-60	142303	Attenuator(20dB)	Suhner	6820.19.A	-	-	-
DFS	MPSC-06	142735	Power Splitters/Combiners	PASTERNACK ENTERPRISES	ZFRSC-123-S+	ZFRSC-123-00231	-	-
DFS	MPSC-07	142736	Power Splitters/Combiners	PASTERNACK ENTERPRISES	ZFRSC-123-S+	ZFRSC-123-00232	-	-
DFS	COTS-MDFS-03	170949	Signal Studio for DFS Radar Profiles	EMC Instruments Corporation	N7607B	-	-	-

***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

APPENDIX 2: Photographs of test setup

Photo 1

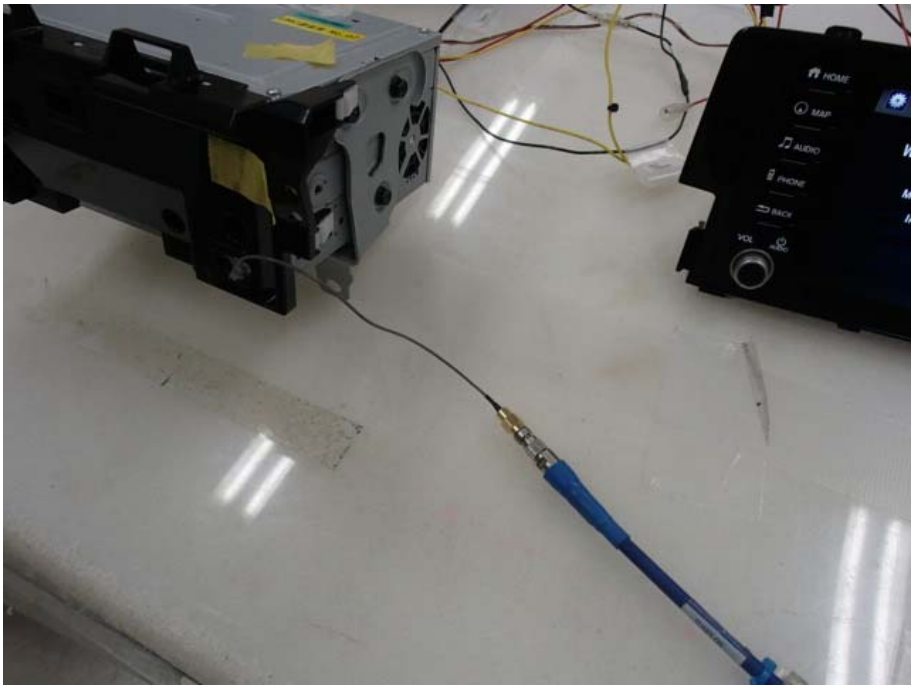


Photo 2

End of Report

UL Japan, Inc.
Ise EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8999
Facsimile : +81 596 24 8124