RADIO TEST REPORT

Test Report No. : 11783009S-A-R1

Applicant	:	**Wistron NeWeb Corporation**
Type of Equipment	:	**WLAN/BT Module**
Model No.	:	**DHSR-SY30**
FCC ID	:	**NKR-SY30**
Test regulation	:	**FCC Part 15 Subpart E: 2017 (DFS test only, Master 20 MHz mode only, Client 20 MHz, 40 MHz and 80 MHz mode (refer to test report, Report No. FZ5D0701-02))**
Test Result	:	**Complied**

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 above regulation.
4. The test results in this 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 NVLAP, NIST, or any agency of the Federal Government.
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. This report is a revised version of 11783009S-A.

Date of test: May 30 to June 1, 2017

Representative test engineer:

Kenichi Adachi
Engineer
Consumer Technology Division

Approved by :

Toyokazu Imamura
Leader
Consumer Technology Division

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

RTL02610

UL Japan, Inc.
Shonan EMC Lab.
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 Japan
Telephone : +81 463 50 6400
Facsimile : +81 463 50 6401

REVISION HISTORY

Original Test Report No.: 11783009S-A

Revision	Test report No.	Date	Page revised	Contents
- (Original)	11783009S-A	August 10, 2017	-	-
1	11783009S-A-R1	October 2, 2017	p.1, p.4, p.10	Added clarification that the bandwidth mode is different between master mode and client mode.

UL Japan, Inc.
Shonan EMC Lab.
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 Japan
Telephone : +81 463 50 6400
Facsimile : +81 463 50 6401

CONTENTS **PAGE**

SECTION 1: Customer information

Company Name	:	Wistron NeWeb Corporation
Address	:	20 Park Avenue II, Hsinchu Science Park, Hsinchu 308, Taiwan, R.O.C.
Contact Person	:	Edward Yeh

SECTION 2: Equipment under test (E.U.T.)

2.1 Identification of E.U.T.

Type of Equipment	:	WLAN/BT Module
Model No.	:	DHSR-SY30
Serial No.	:	Refer to Clause 4.2
Rating	:	DC 4 V
Receipt Date of Sample	:	May 30, 2017
Country of Mass-production	:	China
Condition of EUT	:	Production prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT	:	No Modification by the test lab

2.2 Product Description

Model No: DHSR-SY30 (referred to as the EUT in this report) is the WLAN/BT Module.

General Specification

Clock frequency(ies) in the system	:	26 MHz

Radio Specification

Radio Type	:	Transceiver
Method of Frequency Generation	:	X'tal
Power Supply (inner)	:	DC 4.0 V

	Bluetooth	**IEEE802.11b**	**IEEE802.11g/n (20 MHz band)**	**IEEE802.11a/n (20 MHz band (master), *4) 20 MHz, 40 MHz, 80 MHz band (client))**
Frequency of operation	2402-2480 MHz	2412-2462 MHz	2412-2462 MHz	5180-5240 MHz 5260-5320 MHz *1) 5500-5700 MHz *1) 5745-5825 MHz
Type of modulation	BDR: GFSK, EDR: π/4 DQPSK, 8DPSK, BLE: GFSK	DSSS (CCK, DQPSK, DBPSK)	OFDM (64QAM, 16QAM, QPSK, BPSK)	OFDM (64QAM, 16QAM, QPSK, BPSK)
Channel spacing	BDR/EDR: 1 MHz BLE: 2 MHz	5 MHz		20 MHz (master) *4) 20 MHz, 40 MHz, 80 MHz (client)
Antenna type	(Antenna1) Green PCB antenna + antenna cable (Antenna2) Blue PCB antenna + antenna cable *2),			
Antenna Gain	(Antenna1) maximum: +0.70 dBi (peak), minimum: -3.73 dBi (peak) (Antenna2) maximum: +3.14 dBi (peak), minimum: -4.17 dBi (peak)			
Antenna Connector type	MHF4L			

*1) 5260-5320 MHz, 5500-5700 MHz are applied for this test report.
*2) Antenna is an exclusive choice between antenna 1 and antenna 2, and antenna cable length is exclusive choice between from 50 mm to 900 mm.
*3) This test report is master mode test only, client mode tests are another test report.
*4) This EUT bandwidth mode is that the master mode is 20 MHz only, and the client mode is 20 MHz, 40 MHz, 80 MHz mode.

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: 2017, FCC Part 15 final revised on June 14, 2017 and effective July 14, 2017
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 D04 Operational Modes for DFS Testing New Rules v01
Title	:	OPERATIONAL MODES SUGGESTED FOR DFS TESTING

FCC Part 15.31 (e) / 212 (Supplied voltage requirement)
The RF Module has own regulator.
The RF Module is constantly provided voltage through own regulator regardless of input voltage (DC 4.0 V).
Therefore, this EUT complies with the requirement.

FCC Part 15.203 / 212 (Antenna requirement)
It is impossible for end users to replace the antenna, because the antenna is mounted inside of the final equipment.
And the EUT has a unique antenna connector (MHF4 on the Module). Therefore, the equipment complies with the antenna requirement of Section 15.203/212.

4.2 Procedures and results

Table 1: Applicability of DFS Requirements

<Master mode>

Requirement	Operating Mode	Test Procedures	Limits	Deviation	Results
	Master				
U-NII Detection Bandwidth	Yes	FCC/IC: KDB905462 D02 7.8.1	FCC/IC:KDB905462 D02 5.3	N/A	Complied
Initial Channel Availability Check Time	Yes	FCC/IC: KDB905462 D02 7.8.2.1	FCC:FCC15.407(h)(2)(ii) IC:RSS-247 6.3	N/A	Complied
Radar Burst at the Beginning of the Channel Availability Check Time	Yes	FCC/IC: KDB905462 D02 7.8.2.2	FCC:FCC15.407(h)(2)(ii) IC:RSS-247 6.3	N/A	Complied
Radar Burst at the End of the Channel Availability Check Time	Yes	FCC/IC: KDB905462 D02 7.8.2.3	FCC:FCC15.407(h)(2)(ii) IC:RSS-247 6.3	N/A	Complied
In-Service Monitoring for Channel Move Time, Channel Closing Transmission Time	Yes	FCC/IC: KDB905462 D02 7.8.3	FCC:FCC15.407(h)(2)(iii) IC:RSS-247 6.3	N/A	Complied
In-Service Monitoring for Non-Occupancy period	Yes	FCC/IC: KDB905462 D02 7.8.3	FCC: FCC15.407(h)(2)(iv) IC:RSS-247 6.3	N/A	Complied
Statistical Performance Check	Yes	FCC/IC: KDB905462 D02 7.8.4	FCC/IC:KDB905462 D02 6.1,6.2,6.3	N/A	Complied
Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0422.					

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 Test Location

UL Japan, Inc. Shonan EMC Lab.
1-22-3, Megumigaoka, Hiratsuka-shi, Kanagawa-ken 259-1220 JAPAN
Telephone number : +81 463 50 6400
Facsimile number : +81 463 50 6401
JAB Accreditation No. : RTL02610

	IC Registration No.	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	-	-

4.4 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%

4.5 Data of DFS test, Test instruments of DFS, Test set up

Refer to APPENDIX.

SECTION 5: Operation of E.U.T. during testing

5.1 Operating Modes

For FCC the EUT operates over the 5250-5350MHz and 5470-5725MHz ranges.
For ISED the EUT operates over the 5250-5350MHz and 5470-5725MHz ranges, excluding the 5600-5650MHz range.

The EUT has the Master mode and the Client mode without Radar Detection.

The highest power level was 13.85 dBm on conducted power. (*except antenna gain)
The highest power level was 16.99 dBm (E.I.R.P.). (*maximum value (maximum antenna gain is 3.14 dBi))
(* Refer to test report FR5D0701-02AN (International Certification Corporation))

The channel-loading of approximately 30 % 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 IEEE 802.11a (11a), IEEE 802.11n HT20 (11n HT20) architecture, with a 20MHz channel bandwidth. (master mode)

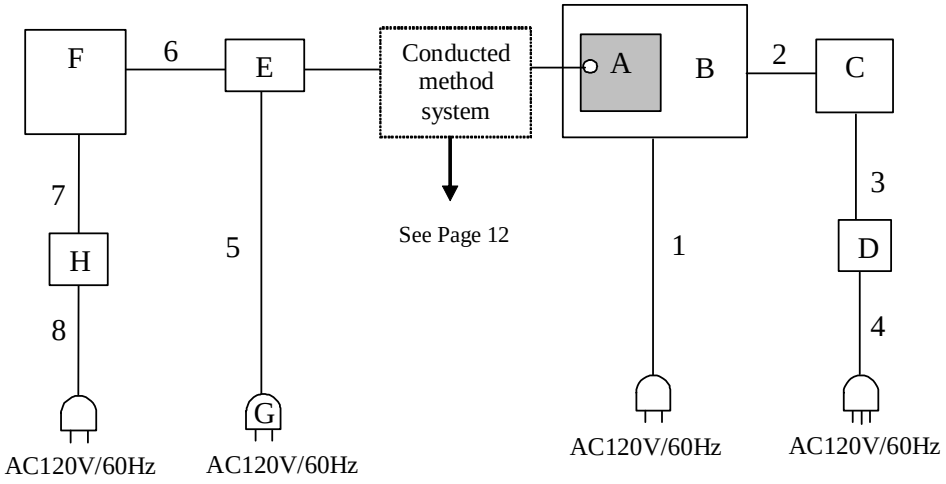
Wireless LAN traffic is generated by sending the same test data by iperf.exe from the Master Device to the Client Device on the test Channel for the entire period of the test.

(In case of Master mode)
The rated output power of the Master Device is <200mW(23dBm) and power spectral density of the Master Device is <10dBm/MHz. However, worst condition was selected for interference threshold level and antenna gain according to the customer's request. 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 + (-4.17) = -67.17 dBm (threshold level + additional 1dB + minimum peak antenna gain).

The EUT was set by the software as follows:
Software name & version: "dfs3_0530.sh (version 1.0)" and "iperf (version 2.0.5)". (for EUT)
MT6625 AP.Test.exe, v0.4(for DFS) (for AE)

5.2 Configuration and peripherals

<Master mode>



* Cabling and setup(s) were taken into consideration and test data was taken under worse case conditions.
* The test was performed using a typical evaluation board (Jig board).

Description of EUT

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	WLAN/BT Module	DHSR-SY30	10091A30095705	Wistron NeWeb	EUT
B	Jig board	-	-	Sony	-
C	Laptop PC	PC-LL550MG	-	NEC	-
D	AC Adapter	ADP-75RB	8225010DC	NEC	-
E	Wireless Transceiver Module	BNSY25	BNSY25-001	Sony	-
F	Laptop PC	7666-77J	LV-B8RDC 08/05	Lenovo	-
G	AC Adapter	AC-M12080C	M1370000027	Sony	-
H	AC Adapter	92P1214	11S92P1213Z1ZDDZ92CB0	Lenovo	-

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	AC Cable	1.7	Unshielded	Unshielded	-
2	USB Cable	1.4 + 0.5	Shielded	Shielded	-
3	DC Cable	1.6	Unshielded	Unshielded	-
4	AC Cable	0.7	Unshielded	Unshielded	-
5	DC Cable	1.5	Unshielded	Unshielded	-
6	USB Cable	1.7	Shielded	Shielded	-
7	DC Cable	1.8	Unshielded	Unshielded	-
8	AC Cable	1.0	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.

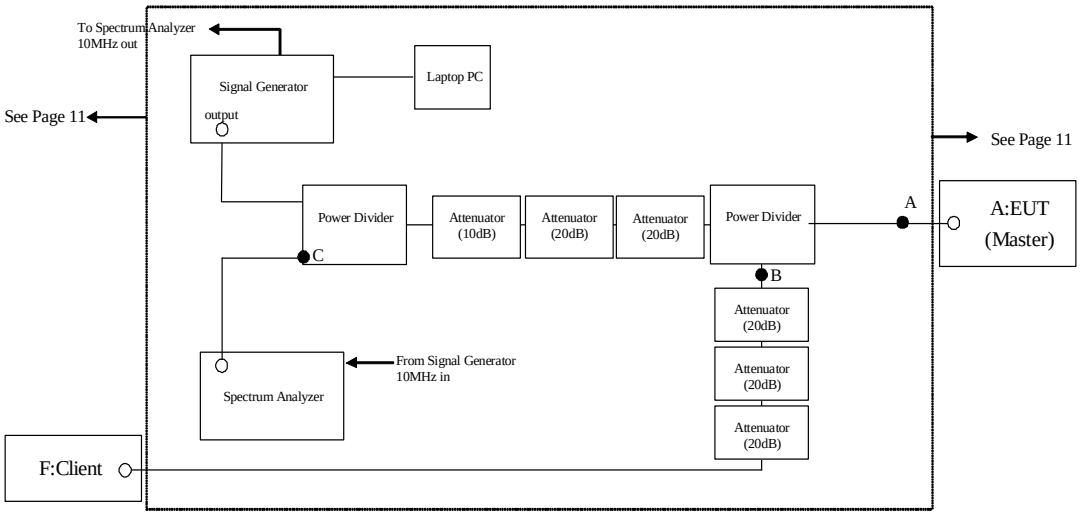
The signal monitoring equipment consists of a spectrum analyzer with the capacity to display 8001 bins on the horizontal axis. A time-domain resolution of 1.625 ms/bin is achievable with a 13 second sweep time, meeting the 10 seconds short pulse reporting criteria. The aggregate ON time is calculated 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

<Master mode>



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 10 MHz IN on the spectrum analyzer and set the spectrum analyzer 10 MHz In to On.

SYSTEM CALIBRATION

<Master mode>
Step 1:Set the system as shown in Figure 2 of KDB905462 D02 7.2.1.
Step 2: Adjust each attenuator to fulfill the following three conditions:
- WLAN can be communicated, and
- Rader detection threshold level is bigger than Master Device traffic level on the spectrum analyzer, and
- Client 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 12)
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.

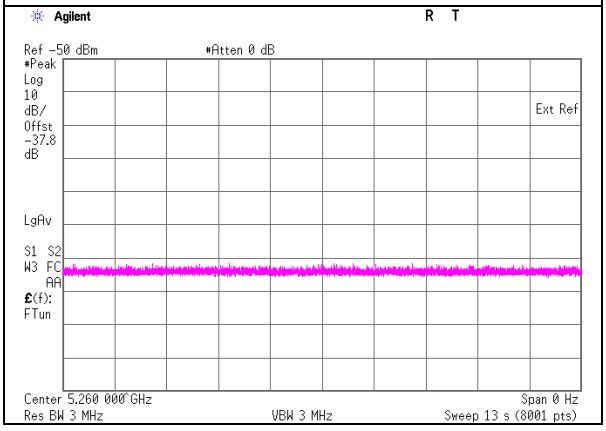
See Clause 5.4 for Plots of Noise, Rader Waveforms, and WLAN signals.

5.4 Plots of Noise, Rader Waveforms, and WLAN signals

<Master mode>

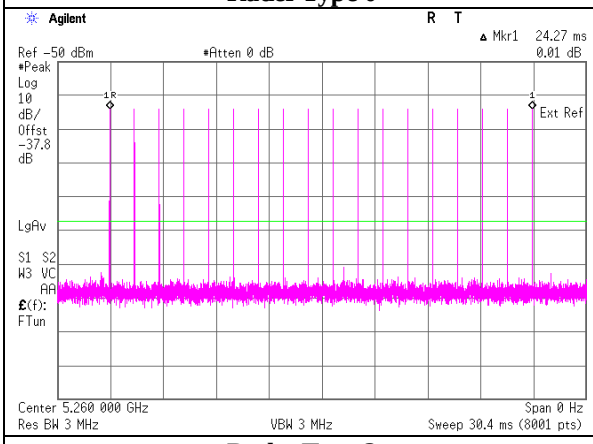
Plots of System Noise Floor

11n HT20

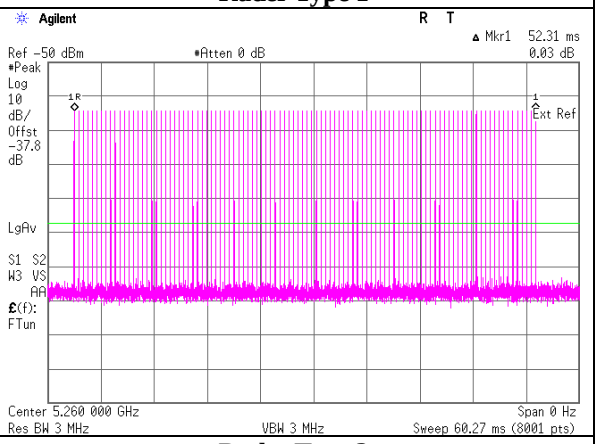


Plots of Radar Waveforms

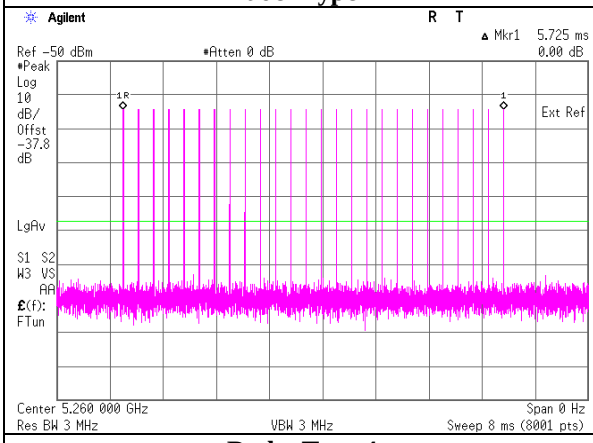
Rader Type 0



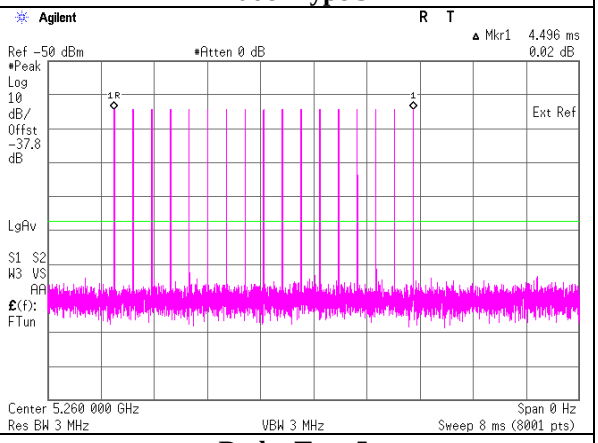
Rader Type 1



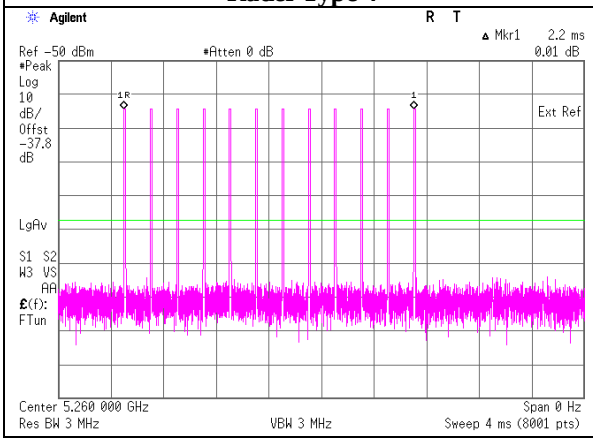
Rader Type 2



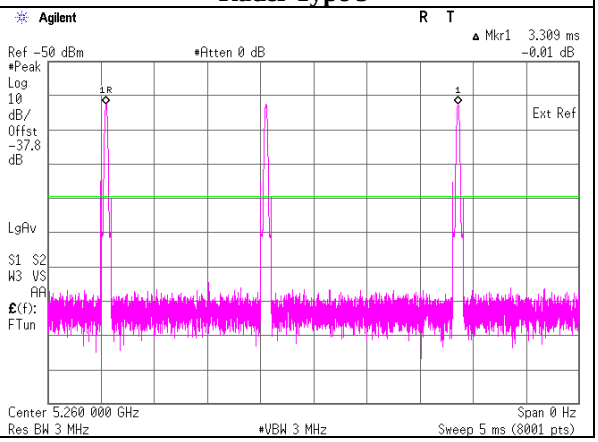
Rader Type 3



Rader Type 4

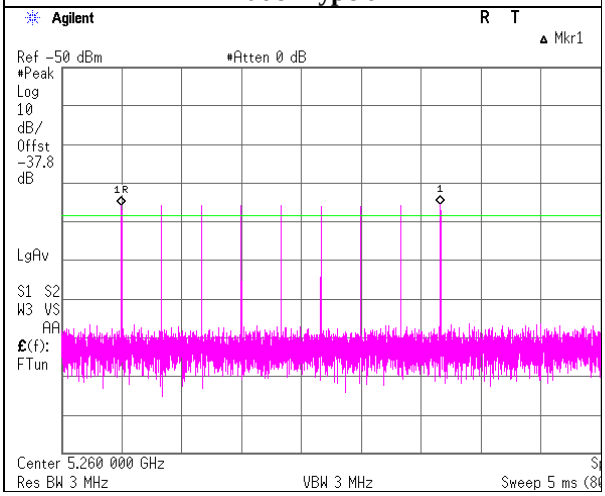


Rader Type 5



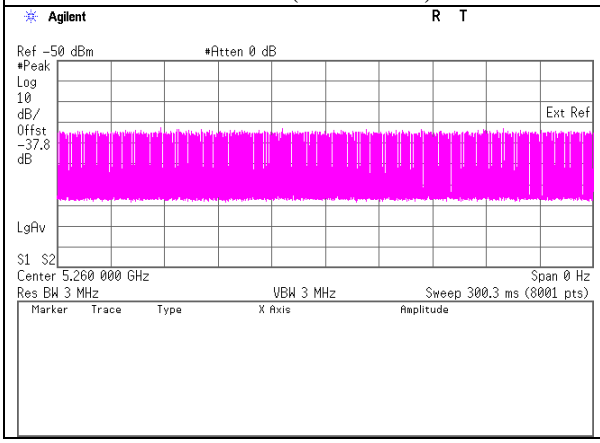
Plots of Radar Waveforms

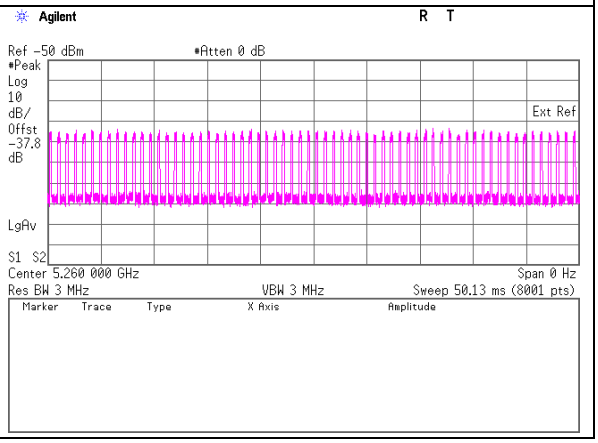
Rader Type 6



Plots of WLAN Traffic

11n HT20 (traffic about 32 %)





SECTION 6: U-NII Detection Bandwidth

6.1 Operating environment

Test place	Shonan EMC Lab. No.5 Shielded room
Date	May 31, 2017
Temperature/ Humidity	24 deg. C / 40 % RH
Engineer	Kenichi Adachi
Mode	Communication 11n HT20

6.2 Test Procedure

Adjust the equipment to produce a single Burst of the Short Pulse Radar Type 0 at the center frequency of the EUT Operating Channel at the specified DFS Detection Threshold level.
Set the EUT up as a standalone device (no associated Client or Master, as appropriate) and no traffic. Frame based systems will be set to a talk/listen ratio reflecting the worst case (maximum) that is user configurable during this test.
Generate a single radar Burst, and note the response of the EUT. Repeat for a minimum of 10 trials. The EUT must detect the Radar Waveform within the DFS band using the specified U-NII Detection Bandwidth criterion. In cases where the channel bandwidth may exceed past the DFS band edge on specific channels (i.e., IEEE802.11n HT20 or wideband frame based systems) select a channel that has the entire emission bandwidth within the DFS band. If this is not possible, test the detection BW to the DFS band edge.

Starting at the center frequency of the EUT operating Channel, increase the radar frequency in 5 MHz steps, repeating the above test sequence, until the detection rate falls below the U-NII Detection Bandwidth criterion. Repeat this measurement in 1MHz steps at frequencies 5 MHz below where the detection rate begins to fall. Record the highest frequency (denote as FH) at which detection is greater than or equal to the U-NII Detection Bandwidth criterion. Recording the detection rate at frequencies above FH is not required to demonstrate compliance.

Starting at the center frequency of the EUT operating Channel, decrease the radar frequency in 5 MHz steps, repeating the above test sequence, until the detection rate falls below the U-NII Detection Bandwidth criterion. Repeat this measurement in 1MHz steps at frequencies 5 MHz above where the detection rate begins to fall. Record the lowest frequency (denote as FL) at which detection is greater than or equal to the U-NII Detection Bandwidth criterion. Recording the detection rate at frequencies below FL is not required to demonstrate compliance.

The U-NII Detection Bandwidth is calculated as follows:
U-NII Detection Bandwidth = FH – FL

Radar detection is observed by two techniques.
a). Monitoring LAN traffic with Spectrum Analyzer.
b). Indicator of the shell program "dfs3_0530.sh" on PC connected to EUT

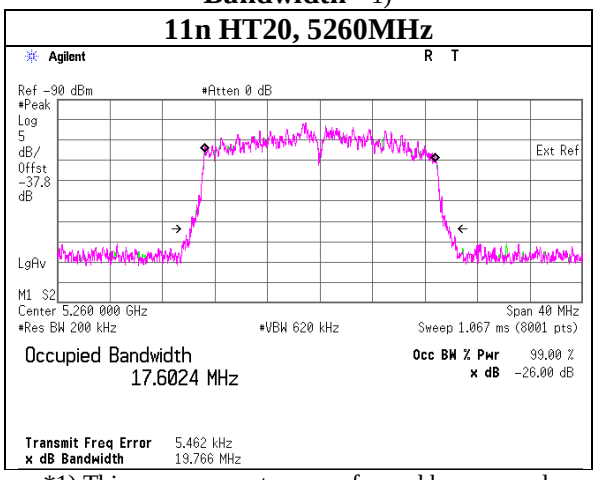
6.3 Test data

5260 MHz (11n HT20)
Waveform : Radar Type 0

FL [MHz]	FH [MHz]	Detection Bandwidth [MHz]	99% Power Bandwidth	Ratio of Detection BW to 99% Power BW [%]	Limit [%]	Results
5249	5271	22	17.6024	125.0	100	Pass

(Reference data) 99% Occupied Bandwidth

Bandwidth *1)



*1) This measurement was performed by a normal communication operation.

6.4 Test result

Test result: Pass

SECTION 7: Initial Channel Availability Check Time

7.1 Operating environment

Test place	Shonan EMC Lab. No.5 Shielded room
Date	May 31, 2017
Temperature/ Humidity	24 deg. C / 40 % RH
Engineer	Kenichi Adachi
Mode	Communication 11n HT20

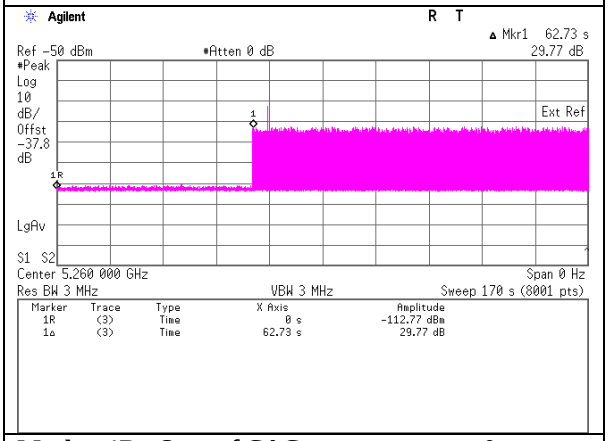
7.2 Test Procedure

The Initial Channel Availability Check Time tests that the EUT does not emit beacon, control, or data signals on the test Channel until the power-up sequence has been completed and the U-NII device checks for Radar Waveforms for one minute on the test Channel.
This test does not use any Radar Waveforms and only needs to be performed one time.
The U-NII devices will be powered on and be instructed to operate on the appropriate U-NII Channel that must incorporate DFS functions. At the same time the EUT is powered on, the spectrum analyzer will be set to zero span mode with a 3 MHz RBW and 3 MHz VBW on the Channel occupied by the radar (Chr) with a 2.5 minute sweep time.
The spectrum analyzer's sweep will be started at the same time power is applied to the U-NII device.
The EUT should not transmit any beacon or data transmissions until at least 1 minute after the completion of the power-on cycle.

7.3 Test data

Initial Channel Availability Check Time

11n HT20



Marker 1R : Start of CAC	**: 0 s**
Marker 1 : End of CAC	**: 62.73 s**
Channel Availability Check Time	**: 62.73 s**

7.4 Test result

Test result: Pass

SECTION 8: Radar Burst at the Beginning of the Channel Availability Check Time

8.1 Operating environment

Test place	Shonan EMC Lab. No.5 Shielded room
Date	May 31, 2017
Temperature/ Humidity	24 deg. C / 40 % RH
Engineer	Kenichi Adachi
Mode	Communication 11n HT20

8.2 Test Procedure

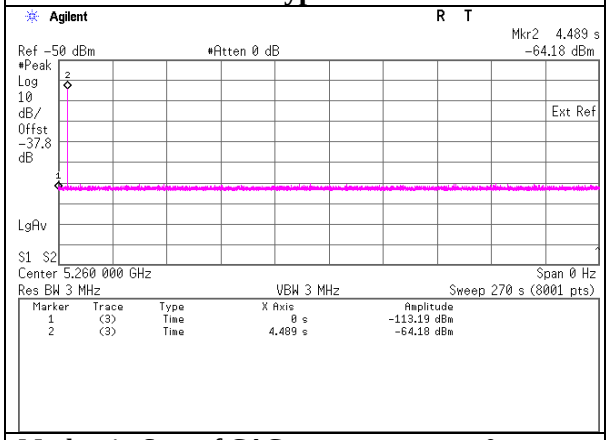
A single Burst of the Short Pulse Radar Types 0-4 will commence within a 6 second window starting at Start of CAC. An additional 1 dB is added to the radar test signal to ensure it is at or above the DFS Detection Threshold, accounting for equipment variations/errors.
Verify that during the 2.5 minute measurement window no EUT transmissions occurred on Chr.

8.3 Test data

Radar Burst at the Beginning of the Channel Availability Check Time

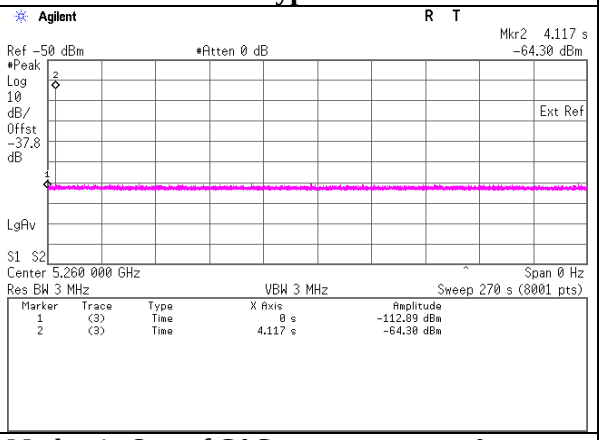
11n HT20

Type0

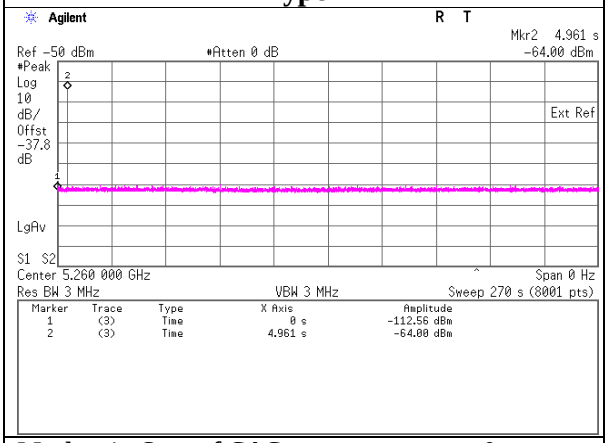
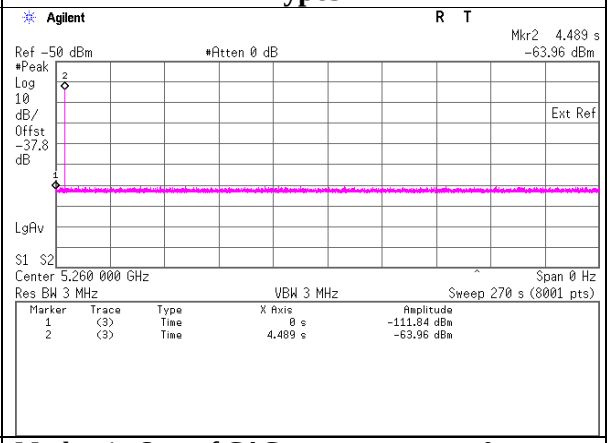
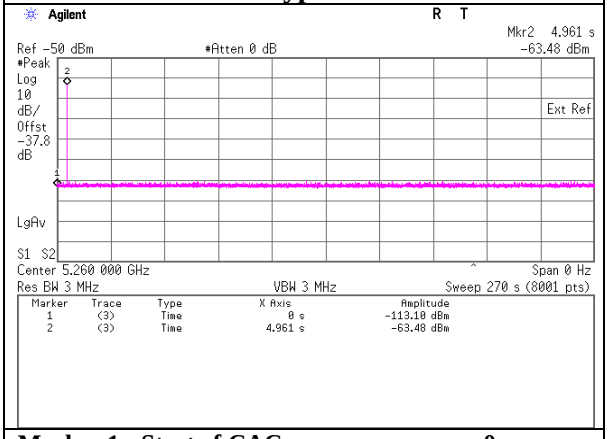


Marker 1 : Start of CAC : 0 s
Marker 2 : Radar Signal(Type 0) applied : 4.489 s

Type1



Marker 1 : Start of CAC : 0 s
Marker 2 : Radar Signal(Type 1) applied : 4.117 s

Radar Burst at the Beginning of the Channel Availability Check Time	
11n HT20	
Type2	**Type3**
	
Marker 1 : Start of CAC : 0 s **Marker 2 : Radar Signal(Type 2) applied : 4.961 s**	**Marker 1 : Start of CAC : 0 s** **Marker 2 : Radar Signal(Type 3) applied : 4.489 s**
Type4	
	
Marker 1 : Start of CAC : 0 s **Marker 2 : Radar Signal(Type 4) applied : 4.961 s**	

8.4 Test result

Test result: Pass

SECTION 9: Radar Burst at the End of the Channel Availability Check Time

9.1 Operating environment

Test place	Shonan EMC Lab. No.5 Shielded room
Date	May 31, 2017
Temperature/ Humidity	24 deg. C / 40 % RH
Engineer	Kenichi Adachi
Mode	Communication 11n HT20

9.2 Test Procedure

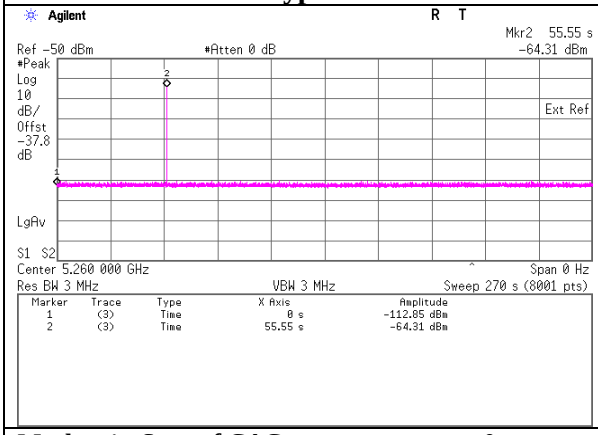
A single Burst of the Short Pulse Radar Types 0-4 will commence within a 6 second window starting at Start of CAC + 54 seconds. An additional 1 dB is added to the radar test signal to ensure it is at or above the DFS Detection Threshold, accounting for equipment variations/errors.
Verify that during the 2.5 minute measurement window no EUT transmissions occurred on Chr.

9.3 Test data

Radar Burst at the End of the Channel Availability Check Time

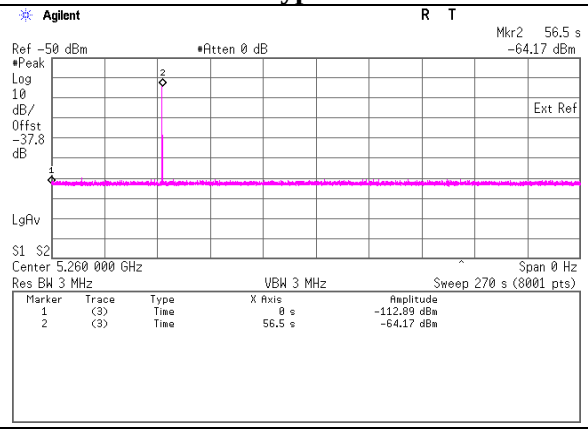
11n HT20

Type0

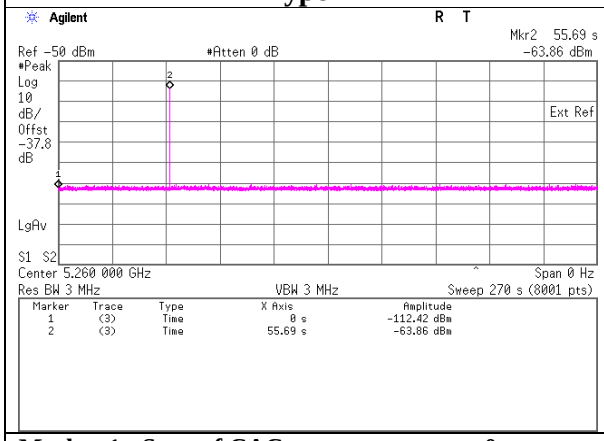
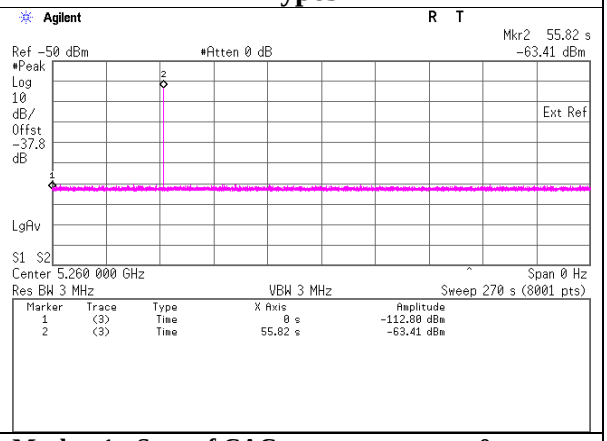
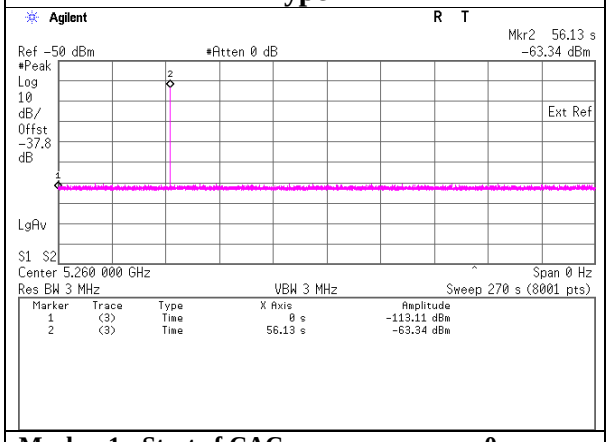


Marker 1 : Start of CAC : 0 s
Marker 2 : Radar Signal(Type 0) applied : 55.55 s

Type1



Marker 1 : Start of CAC : 0 s
Marker 2 : Radar Signal(Type 1) applied : 56.50 s

Radar Burst at the End of the Channel Availability Check Time	
11n HT20	
Type2	**Type3**
	
Marker 1 : Start of CAC : 0 s **Marker 2 : Radar Signal(Type 2) applied : 55.59 s**	**Marker 1 : Start of CAC : 0 s** **Marker 2 : Radar Signal(Type 3) applied : 55.82 s**
Type4	
	
Marker 1 : Start of CAC : 0 s **Marker 2 : Radar Signal(Type 4) applied : 56.13 s**	

9.4 Test result

Test result: Pass

SECTION 10: Channel Move Time, Channel Closing Transmission Time

10.1 Operating environment

Test place	Shonan EMC Lab. No.5 Shielded room
Date	May 30, 2017
Temperature/ Humidity	25 deg. C / 51 % RH
Engineer	Kenichi Adachi
Mode	Communication 11n HT20

10.2 Test Procedure

1) Sending the same test data by iperf.exe 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 at the end of the radar Burst on the Operating Channel for duration greater than 10 seconds.

10.3 Test data

<Master Device>

11n-20

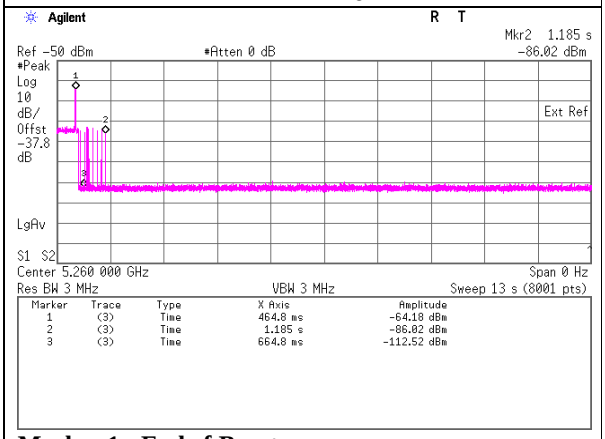
Test Item	Unit	Measurement Time	Limit	Results
Channel Move Time *1)	[sec]	0.720	10.000	Pass
Channel Closing Transmission Time *2)	[msec]	35.75	60	Pass

*1) Channel Move Time is calculated as follows:
(Channel Move Time) = (End of Transmission) - (End of Burst) = 1.185 [ms] - 0.4648 [ms]
*2) Channel Closing Transmission Time is calculated from (End of Burst + 200 ms) to (End of Burst + 10 s)
(Channel Closing Transmission Time) = (Number of analyzer bins showing transmission) × (dwell time per bin)
= 22 × 1.625 [ms]

<Master mode>

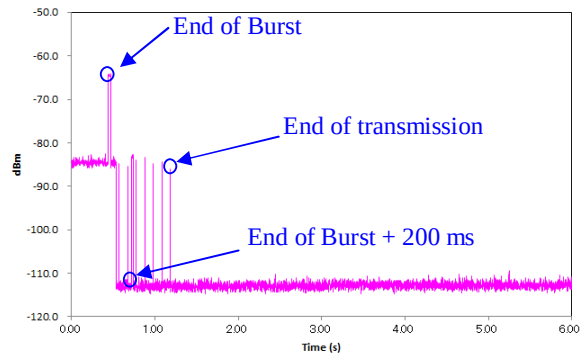
Radar Type 0

11n HT20



Marker 1 : End of Burst
Marker 2 : End of Transmission

Detail chart after end of burst



10.4 Test result

Test result: Pass

SECTION 11: Non-Occupancy Period

11.1 Operating environment

Test place	Shonan EMC Lab. No.5 Shielded room
Date	May 31, 2017
Temperature/ Humidity	24 deg. C / 40 % RH
Engineer	Kenichi Adachi
Mode	Communication 11n HT20

11.2 Test Procedure

The following two tests are performed:

1) Sending the same test data by iperf.exe from the Master Device to the Client Device on the test Channel for the entire period of the test.

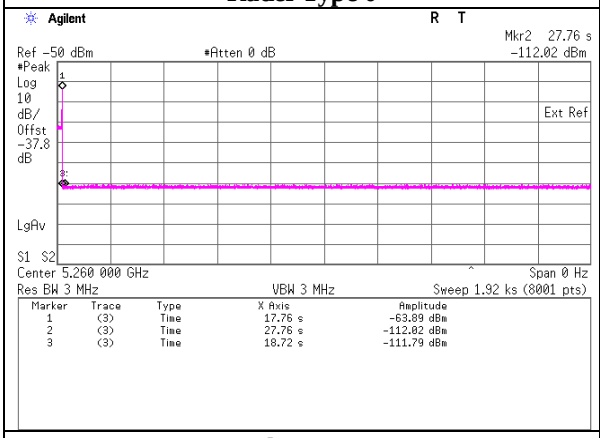
The Radar Waveform generator sends a Burst of pulses for one of the Radar Types 0-4(Master Device) or the Radar Types 0(Client Device) at levels defined on the Operating Channel. An additional 1 dB is added to the radar test signal to ensure it is at or above the DFS Detection Threshold, accounting for equipment variations/errors.
Observe the transmissions of the EUT after the Channel Move Time on the Operating Channel for duration greater than 30 minutes.

11.3 Test data

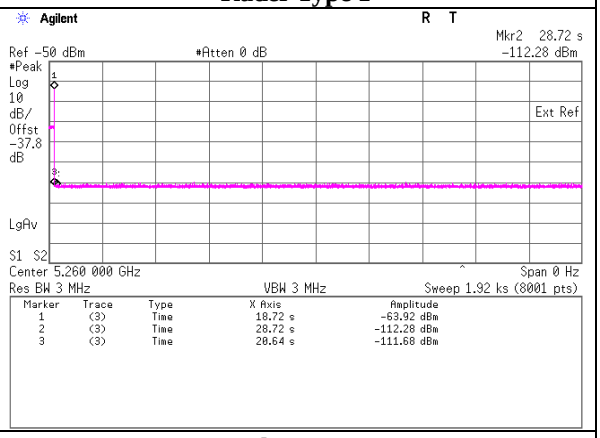
<Master mode>

Non-Occupancy Period

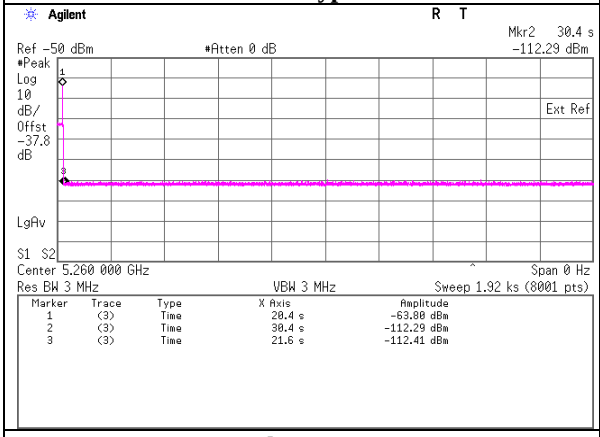
Rader Type 0



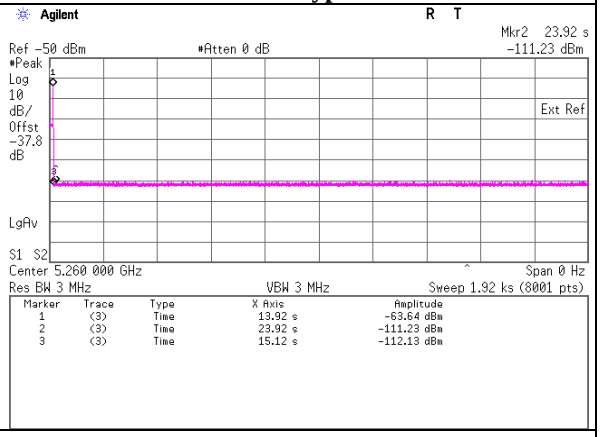
Rader Type 1



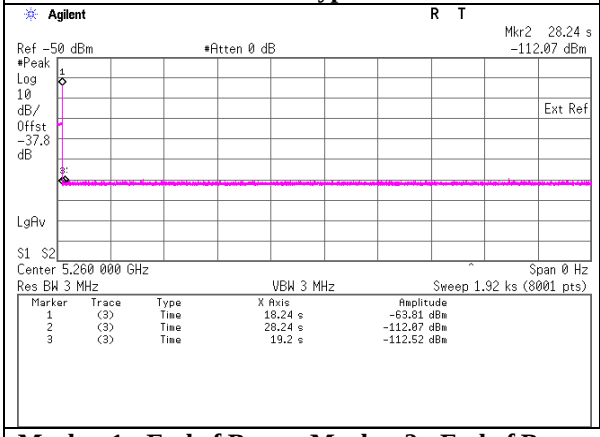
Rader Type 2

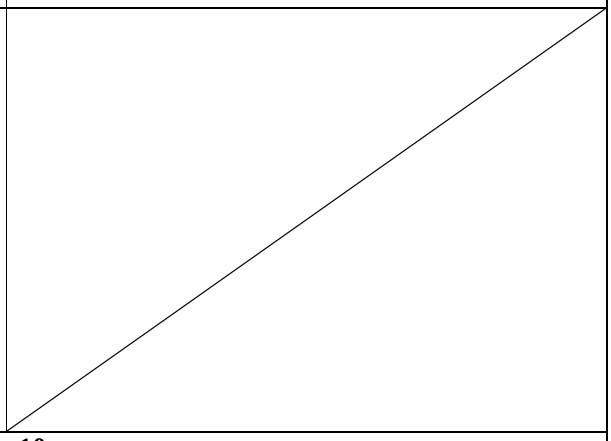


Rader Type 3



Rader Type 4





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

SECTION 12: In-Service Monitoring(Statistical Performance Check)

12.1 Operating environment

Test place	Shonan EMC Lab. No.5 Shielded room	
Date	June 1, 2017 (day time)	June 1, 2017 (night time)
Temperature/ Humidity	25 deg. C / 44 % RH	25 deg. C / 44 % RH
Engineer	Kenichi Adachi	Yosuke Ishikawa
Mode	Communication 11n HT20	

12.2 Test Procedure

Sending the same test data by iperf.exe from the Master Device to the Client Device on the test Channel for the entire period of the test.

Radar Waveform generator sends the individual waveform for each of the Radar Types 1-6, at levels defined, on the Operating Channel. An additional 1dB 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 Burst on the Operating Channel for duration greater than 10 seconds for Short Pulse Radar Types 1-4 and 6 to ensure detection occurs.
Observe the transmissions of the EUT at the end of the Burst on the Operating Channel for duration greater than 22 seconds for Long Pulse Radar Type 5 to ensure detection occurs.

Radar detection is observed by two techniques.
a). Monitoring LAN traffic with Spectrum Analyzer.
b). Indicator of the shell program "dfs3_0530.sh" on PC connected to EUT

12.3 Test data

5300MHz (11n HT20)

Radar Type	Number of Trials	Number of Successful Detections	Percentage of Successful Detections [%]	Limit [%]	Results
1	30	30	100.00	60	Pass
2	30	30	100.00	60	Pass
3	30	24	80.00	60	Pass
4	30	28	93.33	60	Pass
Aggregate of 1 to 4	-	-	93.33	80	Pass
5	30	27	90.00	80	Pass
6	30	30	100.00	70	Pass

12.4 Test result

Test result: Pass

APPENDIX 1: Data of DFS test

U-NII Detection Bandwidth

5260 MHz (11n HT20)

Frequency [MHz]	Number of Trials [Times]	Number of Detected [Times]	Ratio of Detected [%]	Mark
5245	10	0	0	
5246	10	0	0	
5247	10	0	0	
5248	10	0	0	
5249	10	10	100	FL
5250	10	10	100	
5255	10	10	100	
5260	10	10	100	
5265	10	10	100	
5270	10	10	100	
5271	10	10	100	FH
5272	10	0	0	
5273	10	0	0	
5274	10	0	0	
5275	10	0	0	

Statistical Performance Check

5260 MHz (11n HT20)

Trial #	Radar Type1	Radar Type2	Radar Type3	Radar Type4	Radar Type5	Radar Type6
	Dectection	Dectection	Dectection	Dectection	Dectection	Dectection
	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
1	Yes	Yes	No	Yes	Yes	Yes
2	Yes	Yes	Yes	Yes	Yes	Yes
3	Yes	Yes	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes	Yes	Yes
6	Yes	Yes	Yes	Yes	Yes	Yes
7	Yes	Yes	Yes	Yes	Yes	Yes
8	Yes	Yes	Yes	Yes	No	Yes
9	Yes	Yes	Yes	Yes	Yes	Yes
10	Yes	Yes	No	Yes	Yes	Yes
11	Yes	Yes	No	Yes	Yes	Yes
12	Yes	Yes	Yes	Yes	Yes	Yes
13	Yes	Yes	Yes	Yes	Yes	Yes
14	Yes	Yes	Yes	No	Yes	Yes
15	Yes	Yes	Yes	Yes	Yes	Yes
16	Yes	Yes	Yes	Yes	Yes	Yes
17	Yes	Yes	Yes	Yes	Yes	Yes
18	Yes	Yes	Yes	No	Yes	Yes
19	Yes	Yes	No	Yes	Yes	Yes
20	Yes	Yes	Yes	Yes	Yes	Yes
21	Yes	Yes	No	Yes	Yes	Yes
22	Yes	Yes	Yes	Yes	Yes	Yes
23	Yes	Yes	Yes	Yes	No	Yes
24	Yes	Yes	Yes	Yes	Yes	Yes
25	Yes	Yes	No	Yes	Yes	Yes
26	Yes	Yes	Yes	Yes	Yes	Yes
27	Yes	Yes	Yes	Yes	Yes	Yes
28	Yes	Yes	Yes	Yes	Yes	Yes
29	Yes	Yes	Yes	Yes	No	Yes
30	Yes	Yes	Yes	Yes	Yes	Yes
EUT Test Frequency: 5260 MHz Radar Frequency: 5260 MHz						

Parameter Data sheet for Radar Type 1

5260 MHz (11n HT20)

FCC Radar Type1				
Trial #	Pulse Repetition Frequency Number(1 to 23)	Pulse Repetition Frequency (Pulses Per Second)	Number of Pulses	Pulse Repetition Interval [ms]
1	8	1519.8	81	658
2	21	1089.3	58	918
3	14	1285.3	68	778
4	2	1858.7	99	538
5	10	1432.7	76	698
6	1	1930.5	102	518
7	9	1474.9	78	678
8	18	1165.6	62	858
9	7	1567.4	83	638
10	19	1139.0	61	878
11	11	1392.8	74	718
12	6	1618.1	86	618
13	4	1730.1	92	578
14	13	1319.3	70	758
15	23	326.2	18	3066
16	3a	1834.9	97	545
17	16a	1221.0	65	819
18	5a	1721.2	91	581
19	12a	1338.7	71	747
20	22a	1904.8	101	525
21	17a	1175.1	63	851
22	15a	1236.1	66	809
23	20a	1103.8	59	906
24	15b	1236.1	66	809
25	5b	1669.4	89	599
26	17b	1175.1	63	851
27	3b	1779.4	94	562
28	22b	1904.8	101	525
29	12b	1338.7	71	747
30	20b	1103.8	59	906

Parameter Data sheet for Radar Type 2

5260 MHz (11n HT20)

Radar Type2			
Trial #	Number Pulses per	Pulse Width [us]	PRI [us]
1	26	3.8	229
2	29	3.4	209
3	26	4.4	183
4	27	2.3	201
5	28	3.9	195
6	26	1.6	164
7	29	1.2	185
8	23	1.1	170
9	25	3.9	160
10	28	2.8	166
11	27	4.6	151
12	28	2.0	228
13	28	3.5	212
14	25	4.0	173
15	23	5.0	156
16	24	3.2	206
17	28	1.2	152
18	23	4.7	176
19	29	3.7	156
20	27	3.7	165
21	27	3.7	176
22	26	4.7	156
23	29	2.6	198
24	26	4.5	215
25	29	4.6	228
26	27	3.6	167
27	23	4.8	208
28	29	2.4	199
29	25	4.2	228
30	28	1.2	167

Parameter Data sheet for Radar Type 3

5260 MHz (11n HT20)

Radar Type3			
Trial #	Number Pulses per	Pulse Width [us]	PRI [us]
1	17	7.0	281
2	16	9.0	221
3	16	9.2	266
4	17	6.4	211
5	16	6.5	250
6	18	7.7	269
7	16	6.9	334
8	17	9.4	409
9	17	9.2	270
10	18	6.4	261
11	17	9.7	377
12	17	7.2	261
13	17	8.9	258
14	18	6.8	363
15	17	9.9	291
16	16	7.9	448
17	17	6.7	345
18	16	6.5	232
19	18	9.0	450
20	16	9.7	455
21	17	9.8	277
22	18	6.5	367
23	18	6.9	459
24	17	8.2	339
25	18	8.5	274
26	16	6.8	216
27	17	8.9	360
28	17	9.6	449
29	16	6.9	448
30	18	6.0	261

Parameter Data sheet for Radar Type 4

5260 MHz (11n HT20)

Radar Type4			
Trial #	Number Pulses per	Pulse Width [us]	PRI [us]
1	12	13.7	200
2	14	19.2	481
3	13	12.5	283
4	15	18.4	399
5	13	12.5	489
6	14	16.6	286
7	13	11.1	225
8	14	17.1	401
9	16	18.9	372
10	13	19.5	357
11	13	12.8	307
12	12	13.2	409
13	13	12.0	337
14	15	21.0	444
15	13	15.7	498
16	14	16.9	247
17	16	20.8	466
18	13	19.0	309
19	16	13.4	483
20	13	16.6	427
21	12	19.2	277
22	12	13.9	283
23	14	19.4	284
24	15	18.5	299
25	16	20.7	467
26	16	12.1	383
27	13	15.9	434
28	14	13.4	210
29	13	15.8	426
30	13	20.3	467

Parameter Data sheet for Radar Type 5

5260 MHz (11n HT20)

Trial #	Burst Number	Number of Pulses	Pulse Width [µs]	Radar frequency [MHz]	Chirp Width [MHz]	Pulse 1-to-2 Spacing [µs]	Pulse 2-to-3 Spacing [µs]	Starting Location Within Interval [µs]
1	1	3	60	5257.00	15	1227	1775	575084
	2	1	56	5257.00	15			920549
	3	1	75	5257.00	15			1302318
	4	3	78	5257.00	15	1902	1321	497781
	5	3	56	5257.00	15	1565	1973	1337014
	6	2	94	5257.00	15	1966		1301075
	7	1	96	5257.00	15			508455
	8	3	58	5257.00	15	1869	1737	1522930
	9	1	87	5257.00	15			128930
	10	1	68	5257.00	15			1020118
	11	1	50	5257.00	15			967967
	12	2	86	5257.00	15	1270		1677394

Trial #	Burst Number	Number of Pulses	Pulse Width [µs]	Radar frequency [MHz]	Chirp Width [MHz]	Pulse 1-to-2 Spacing [µs]	Pulse 2-to-3 Spacing [µs]	Starting Location Within Interval [µs]
2	1	3	57	5255.00	10	1821	1602	16504
	2	2	51	5255.00	10	1612		1200097
	3	1	99	5255.00	10			514512
	4	3	61	5255.00	10	1735	1260	556990
	5	3	74	5255.00	10	1762	1842	1064831
	6	3	88	5255.00	10	1891	1361	201080
	7	3	57	5255.00	10	1447	1738	1139421
	8	3	55	5255.00	10	1213	1698	574302
	9	3	100	5255.00	10	1430	1589	667333
	10	2	56	5255.00	10	1230		1075648
	11	2	75	5255.00	10	1394		78596
	12	2	65	5255.00	10	1117		762924
	13	2	65	5255.00	10	1542		1025766
	14	1	64	5255.00	10			425507
	15	3	99	5255.00	10	1454	1179	718860
	16	3	72	5255.00	10	1616	1139	880624
	17	2	99	5255.00	10	1334		763070

Trial #	Burst Number	Number of Pulses	Pulse Width [µs]	Radar frequency [MHz]	Chirp Width [MHz]	Pulse 1-to-2 Spacing [µs]	Pulse 2-to-3 Spacing [µs]	Starting Location Within Interval [µs]
3	1	2	62	5257.40	16	1000		1415338
	2	3	64	5257.40	16	1587	1405	1101987
	3	2	96	5257.40	16	1323		515293
	4	1	80	5257.40	16			1708711
	5	2	81	5257.40	16	1748		1974462
	6	1	86	5257.40	16			1284154
	7	2	59	5257.40	16	1194		1952571
	8	2	81	5257.40	16	1472		1058521

Trial #	Burst Number	Number of Pulses	Pulse Width [µs]	Radar frequency [MHz]	Chirp Width [MHz]	Pulse 1-to-2 Spacing [µs]	Pulse 2-to-3 Spacing [µs]	Starting Location Within Interval [µs]
4	1	3	71	5253.80	7	1872	1110	239921
	2	2	85	5253.80	7	1645		1893817
	3	2	53	5253.80	7	1384		1047130
	4	3	73	5253.80	7	1783	1735	779766
	5	2	87	5253.80	7	1551		872223
	6	2	90	5253.80	7	1710		1077386
	7	3	62	5253.80	7	1972	1474	1179342
	8	2	52	5253.80	7	1111		1179405
	9	3	62	5253.80	7	1970	1109	1013258
	10	1	55	5253.80	7			993717
	11	1	65	5253.80	7			979119

Trial #	Burst Number	Number of Pulses	Pulse Width [µs]	Radar frequency [MHz]	Chirp Width [MHz]	Pulse 1-to-2 Spacing [µs]	Pulse 2-to-3 Spacing [µs]	Starting Location Within Interval [µs]
5	1	3	86	5256.60	14	1113	1246	961334
	2	3	76	5256.60	14	1079	1449	190757
	3	2	94	5256.60	14	1039		2056822
	4	1	63	5256.60	14			750576
	5	3	83	5256.60	14	1703	1675	1303943
	6	3	55	5256.60	14	1744	1136	356923
	7	3	95	5256.60	14	1374	1760	1435088
	8	1	61	5256.60	14			968607
	9	3	75	5256.60	14	1832	1763	1107426
	10	3	88	5256.60	14	1622	1273	1179449
	11	1	84	5256.60	14			1049833

Trial #	Burst Number	Number of Pulses	Pulse Width [µs]	Radar frequency [MHz]	Chirp Width [MHz]	Pulse 1-to-2 Spacing [µs]	Pulse 2-to-3 Spacing [µs]	Starting Location Within Interval [µs]
6	1	2	99	5258.60	19	1000		460668
	2	2	56	5258.60	19	1061		680701
	3	3	92	5258.60	19	1026	1004	625277
	4	3	87	5258.60	19	1828	1578	768629
	5	3	64	5258.60	19	1713	1709	1102371
	6	3	69	5258.60	19	1408	1594	661559
	7	1	56	5258.60	19			353914
	8	3	68	5258.60	19	1195	1852	633097
	9	2	91	5258.60	19	1127		954557
	10	3	81	5258.60	19	1059	1663	590853
	11	2	66	5258.60	19	1437		948035
	12	2	68	5258.60	19	1518		659256
	13	3	85	5258.60	19	1037	1519	964449
	14	1	89	5258.60	19			743685
	15	1	95	5258.60	19			427607
	16	3	77	5258.60	19	1635	1256	1133046

Trial #	Burst Number	Number of Pulses	Pulse Width [µs]	Radar frequency [MHz]	Chirp Width [MHz]	Pulse 1-to-2 Spacing [µs]	Pulse 2-to-3 Spacing [µs]	Starting Location Within Interval [µs]
7	1	1	91	5254.20	8			88
	2	2	89	5254.20	8	1956		1014249
	3	3	68	5254.20	8	1862	1291	1326671
	4	2	72	5254.20	8	1069		1422016
	5	3	94	5254.20	8	1802	1659	1213631
	6	2	86	5254.20	8	1919		794208
	7	3	95	5254.20	8	1045	1010	516326
	8	2	71	5254.20	8	1029		1456442
	9	3	71	5254.20	8	1176	1676	574818
	10	2	92	5254.20	8	1981		1212240
	11	2	67	5254.20	8	1232		1105535
	12	2	72	5254.20	8	1164		647611

Trial #	Burst Number	Number of Pulses	Pulse Width [µs]	Radar frequency [MHz]	Chirp Width [MHz]	Pulse 1-to-2 Spacing [µs]	Pulse 2-to-3 Spacing [µs]	Starting Location Within Interval [µs]
8	1	1	63	5256.20	13			1226
	2	3	55	5256.20	13	1120	1908	2937098
	3	1	79	5256.20	13			147010
	4	1	96	5256.20	13			2079569
	5	2	76	5256.20	13	1827		1182682
	6	2	79	5256.20	13	1067		2120148
	7	1	55	5256.20	13			892585
	8	2	74	5256.20	13	1332		1485101

Trial #	Burst Number	Number of Pulses	Pulse Width [µs]	Radar frequency [MHz]	Chirp Width [MHz]	Pulse 1-to-2 Spacing [µs]	Pulse 2-to-3 Spacing [µs]	Starting Location Within Interval [µs]
9	1	2	90	5259.00	20	1000		329192
	2	1	89	5259.00	20			1210989
	3	2	76	5259.00	20	1881		1027132
	4	1	56	5259.00	20			963516
	5	3	56	5259.00	20	1440	1238	738460
	6	1	84	5259.00	20			753805
	7	2	55	5259.00	20	1686		1211395
	8	3	54	5259.00	20	1727	1352	548737
	9	2	56	5259.00	20	1317		1427803
	10	3	68	5259.00	20	1101	1979	308726
	11	1	96	5259.00	20			1519486
	12	1	61	5259.00	20			1000420
	13	1	59	5259.00	20			115021

Trial #	Burst Number	Number of Pulses	Pulse Width [µs]	Radar frequency [MHz]	Chirp Width [MHz]	Pulse 1-to-2 Spacing [µs]	Pulse 2-to-3 Spacing [µs]	Starting Location Within Interval [µs]
10	1	1	96	5254.60	9			685
	2	3	97	5254.60	9	1463	1626	1760880
	3	1	72	5254.60	9			1489891
	4	3	85	5254.60	9	1266	1901	1794345
	5	3	81	5254.60	9	1395	1951	791445
	6	1	80	5254.60	9			2003312
	7	1	81	5254.60	9			888899
	8	3	71	5254.60	9	1476	1393	1135413
	9	3	80	5254.60	9	1875	1379	1677595

Trial #	Burst Number	Number of Pulses	Pulse Width [µs]	Radar frequency [MHz]	Chirp Width [MHz]	Pulse 1-to-2 Spacing [µs]	Pulse 2-to-3 Spacing [µs]	Starting Location Within Interval [µs]
11	1	1	50	5260	5			327
	2	2	72	5260	5	1575		954355
	3	1	98	5260	16			1203009
	4	3	94	5260	19	1851	1829	781005
	5	2	67	5260	14	1708		181504
	6	3	76	5260	17	1632	1231	889492
	7	1	66	5260	11			949088
	8	3	52	5260	17	1094	1991	518479
	9	1	85	5260	20			896268
	10	3	98	5260	16	1503	1806	622405
	11	1	65	5260	15			741745
	12	2	91	5260	9	1510		1061579
	13	1	75	5260	11			223168
	14	3	92	5260	14	1931	1010	724577
	15	1	95	5260	13			1375036
	16	3	58	5260	15	1728	1359	384022

Trial #	Burst Number	Number of Pulses	Pulse Width [µs]	Radar frequency [MHz]	Chirp Width [MHz]	Pulse 1-to-2 Spacing [µs]	Pulse 2-to-3 Spacing [µs]	Starting Location Within Interval [µs]
12	1	2	95	5260.00	8	1000		605191
	2	1	52	5260.00	6			1905255
	3	3	86	5260.00	19	1098	1201	1379472
	4	1	53	5260.00	18			305010
	5	3	89	5260.00	5	1574	1538	2164153
	6	2	68	5260.00	20	1299		1518501
	7	2	73	5260.00	9	1071		1338644
	8	3	84	5260.00	5	1548	1432	212765
	9	3	67	5260.00	14	1172	1083	2339058

Trial #	Burst Number	Number of Pulses	Pulse Width [µs]	Radar frequency [MHz]	Chirp Width [MHz]	Pulse 1-to-2 Spacing [µs]	Pulse 2-to-3 Spacing [µs]	Starting Location Within Interval [µs]
13	1	2	83	5260.00	15	1000		462632
	2	2	81	5260.00	11	1467		697031
	3	3	73	5260.00	14	1304	1224	1004125
	4	1	71	5260.00	5			978866
	5	2	53	5260.00	10	1916		535385
	6	2	81	5260.00	7	1200		643293
	7	1	88	5260.00	12			755408
	8	2	100	5260.00	15	1922		731546
	9	2	75	5260.00	15	1631		659792
	10	2	72	5260.00	8	1797		910401
	11	3	53	5260.00	12	1828	1559	1257274
	12	2	71	5260.00	7	1286		309314
	13	1	62	5260.00	7			952772
	14	1	76	5260.00	10			733100
	15	3	80	5260.00	5	1693	1013	795137

Trial #	Burst Number	Number of Pulses	Pulse Width [µs]	Radar frequency [MHz]	Chirp Width [MHz]	Pulse 1-to-2 Spacing [µs]	Pulse 2-to-3 Spacing [µs]	Starting Location Within Interval [µs]
14	1	3	64	5260.00	9	1060	1389	1389247
	2	3	68	5260.00	18	1857	1211	926201
	3	3	73	5260.00	18	1298	1967	1375009
	4	2	56	5260.00	20	1324		2259483
	5	2	59	5260.00	12	1921		604411
	6	1	92	5260.00	19			2357848
	7	1	76	5260.00	17			130961
	8	3	83	5260.00	20	1225	1229	1809280

Trial #	Burst Number	Number of Pulses	Pulse Width [µs]	Radar Frequency [MHz]	Chirp Width [MHz]	Pulse 1-to-2 Spacing [µs]	Pulse 2-to-3 Spacing [µs]	Starting Location Within Interval [µs]
15	1	2	95	5260.00	15	1000		310315
	2	1	89	5260.00	7			707626
	3	3	69	5260.00	16	1227	1303	585651
	4	3	55	5260.00	13	1166	1666	585167
	5	1	84	5260.00	8			589367
	6	1	61	5260.00	11			546039
	7	2	64	5260.00	5	1242		787147
	8	1	67	5260.00	10			637162
	9	3	80	5260.00	19	1696	1760	338120
	10	1	72	5260.00	8			363256
	11	3	64	5260.00	12	1857	1796	873128
	12	2	78	5260.00	11	1803		586828
	13	2	52	5260.00	18	1085		288392
	14	3	58	5260.00	13	1342	1690	1068905
	15	2	54	5260.00	19	1840		160550
	16	3	54	5260.00	18	1780	1023	567933
	17	1	58	5260.00	17			763000
	18	1	75	5260.00	9			574918
	19	3	58	5260.00	15	1270	1114	839740
	20	2	64	5260.00	7	1157		389076

Trial #	Burst Number	Number of Pulses	Pulse Width [µs]	Radar frequnecy [MHz]	Chirp Width [MHz]	Pulse 1-to-2 Spacing [µs]	Pulse 2-to-3 Spacing [µs]	Starting Location Within Interval [µs]
16	1	2	89	5260.00	6	1000		49861
	2	2	60	5260.00	16	1795		836538
	3	2	93	5260.00	17	1753		780471
	4	3	54	5260.00	12	1971	1127	819482
	5	3	60	5260.00	20	1822	1948	739385
	6	1	62	5260.00	5			630956
	7	1	66	5260.00	13			564147
	8	3	69	5260.00	9	1107	1599	693165
	9	1	92	5260.00	8			219010
	10	2	56	5260.00	16	1839		934633
	11	2	70	5260.00	13	1781		640981
	12	3	98	5260.00	7	1660	1756	971301
	13	3	89	5260.00	16	1403	1250	551321
	14	1	80	5260.00	10			807473
	15	2	63	5260.00	5	1987		490971
	16	1	67	5260.00	16			697664
	17	2	63	5260.00	12	1615		527918
	18	2	82	5260.00	16	1134		733209

Trial #	Burst Number	Number of Pulses	Pulse Width [µs]	Radar frequency [MHz]	Chirp Width [MHz]	Pulse 1-to-2 Spacing [µs]	Pulse 2-to-3 Spacing [µs]	Starting Location Within Interval [µs]
17	1	2	70	5260.00	14	1000		253751
	2	2	54	5260.00	11	1286		907342
	3	2	54	5260.00	13	1177		597469
	4	3	53	5260.00	20	1956	1940	1573880
	5	1	73	5260.00	9			911911
	6	1	56	5260.00	5			144413
	7	2	66	5260.00	10	1887		1114912
	8	3	71	5260.00	5	1176	1398	1029206
	9	3	95	5260.00	10	1062	1896	879427
	10	1	87	5260.00	16			935024
	11	3	50	5260.00	17	1584	1876	551976
	12	1	82	5260.00	8			678835
	13	3	65	5260.00	9	1827	1324	1013614
	14	1	82	5260.00	16			1085813

Trial #	Burst Number	Number of Pulses	Pulse Width [µs]	Radar frequency [MHz]	Chirp Width [MHz]	Pulse 1-to-2 Spacing [µs]	Pulse 2-to-3 Spacing [µs]	Starting Location Within Interval [µs]
18	1	3	79	5260.00	9	1578	1788	268637
	2	2	67	5260.00	9	1514		752569
	3	3	92	5260.00	15	1299	1871	359308
	4	2	59	5260.00	10	1371		985135
	5	2	56	5260.00	7	1305		680191
	6	2	60	5260.00	12	1715		543619
	7	3	88	5260.00	19	1839	1745	552891
	8	3	70	5260.00	17	1542	1702	897459
	9	3	53	5260.00	16	1594	1106	698467
	10	3	71	5260.00	17	1758	1631	638609
	11	3	81	5260.00	7	1588	1025	572823
	12	1	74	5260.00	11			836677
	13	2	65	5260.00	16	1024		242917
	14	2	83	5260.00	15	1095		652469
	15	1	88	5260.00	11			1010281
	16	3	78	5260.00	10	1394	1248	566310
	17	1	73	5260.00	14			442208
	18	2	53	5260.00	6	1994		980307

Trial #	Burst Number	Number of Pulses	Pulse Width [µs]	Radar frequency [MHz]	Chirp Width [MHz]	Pulse 1-to-2 Spacing [µs]	Pulse 2-to-3 Spacing [µs]	Starting Location Within Interval [µs]
19	1	2	71	5260.00	19	1000		530435
	2	3	71	5260.00	6	1166	1863	158787
	3	3	91	5260.00	14	1272	1818	1241581
	4	3	95	5260.00	15	1421	1315	416157
	5	1	73	5260.00	20			678333
	6	2	89	5260.00	13	1098		728278
	7	1	79	5260.00	15			422107
	8	2	59	5260.00	9	1628		968283
	9	3	83	5260.00	20	1772	1398	486334
	10	3	91	5260.00	6	1987	1547	485780
	11	1	81	5260.00	16			622765
	12	2	77	5260.00	8	1363		1075927
	13	3	51	5260.00	19	1208	1329	790744
	14	3	83	5260.00	19	1054	1486	408006
	15	2	64	5260.00	15	1208		828072
	16	1	87	5260.00	11			261539
	17	2	82	5260.00	18	1221		617347
	18	1	100	5260.00	8			985444

Trial #	Burst Number	Number of Pulses	Pulse Width [µs]	Radar frequency [MHz]	Chirp Width [MHz]	Pulse 1-to-2 Spacing [µs]	Pulse 2-to-3 Spacing [µs]	Starting Location Within Interval [µs]
20	1	2	67	5260.00	14	1000		417577
	2	3	89	5260.00	15	1814	1200	1131359
	3	2	84	5260.00	11	1972		76634
	4	2	97	5260.00	16	1348		807464
	5	1	81	5260.00	12			1276532
	6	3	89	5260.00	12	1350	1577	328883
	7	3	89	5260.00	12	1439	1610	1029050
	8	2	91	5260.00	18	1436		993643
	9	1	50	5260.00	7			333185
	10	2	99	5260.00	16	1813		794234
	11	1	73	5260.00	17			893811
	12	1	63	5260.00	11			1250384
	13	1	100	5260.00	6			717965
	14	3	64	5260.00	6	1341	1643	346891
	15	2	80	5260.00	5	1951		843153

Trial #	Burst Number	Number of Pulses	Pulse Width [µs]	Radar frequency [MHz]	Chirp Width [MHz]	Pulse 1-to-2 Spacing [µs]	Pulse 2-to-3 Spacing [µs]	Starting Location Within Interval [µs]
21	1	2	77	5266.60	6	1000		368006
	2	3	55	5266.60	6	1218	1023	362182
	3	1	80	5266.60	6			561223
	4	2	98	5266.60	6	1848		851181
	5	1	72	5266.60	6			655852
	6	3	82	5266.60	6	1785	1084	728379
	7	2	60	5266.60	6	1523		512563
	8	3	92	5266.60	6	1140	1502	544059
	9	3	76	5266.60	6	1913	1222	611128
	10	1	83	5266.60	6			223988
	11	1	51	5266.60	6			789595
	12	3	72	5266.60	6	1332	1548	650844
	13	2	91	5266.60	6	1362		804478
	14	2	92	5266.60	6	1812		406864
	15	1	90	5266.60	6			773325
	16	2	69	5266.60	6	1653		161082
	17	3	81	5266.60	6	1537	1582	1046372
	18	1	50	5266.60	6			329771
	19	1	90	5266.60	6			610900
	20	1	57	5266.60	6			674092

Trial #	Burst Number	Number of Pulses	Pulse Width [µs]	Radar frequency [MHz]	Chirp Width [MHz]	Pulse 1-to-2 Spacing [µs]	Pulse 2-to-3 Spacing [µs]	Starting Location Within Interval [µs]
22	1	3	92	5264.60	11	1109	1096	852484
	2	2	93	5264.60	11	1475		717911
	3	2	71	5264.60	11	1565		423306
	4	3	79	5264.60	11	1782	1530	1243039
	5	2	76	5264.60	11	1121		1010150
	6	2	66	5264.60	11	1823		1219285
	7	2	55	5264.60	11	1703		730263
	8	2	99	5264.60	11	1465		696600
	9	3	81	5264.60	11	1898	1870	818049
	10	1	94	5264.60	11			1163712
	11	1	85	5264.60	11			533665
	12	1	50	5264.60	11			996282
	13	3	92	5264.60	11	1637	1371	1306557.923

Trial #	Burst Number	Number of Pulses	Pulse Width [µs]	Radar frequency [MHz]	Chirp Width [MHz]	Pulse 1-to-2 Spacing [µs]	Pulse 2-to-3 Spacing [µs]	Starting Location Within Interval [µs]
23	1	2	71	5262.20	17	1000		481876
	2	1	55	5262.20	17			952766
	3	1	61	5262.20	17			2054479
	4	2	90	5262.20	17	1871		1202925
	5	2	55	5262.20	17	1416		890260
	6	2	84	5262.20	17	1528		2220463
	7	1	64	5262.20	17			776117
	8	1	88	5262.20	17			1884578
	9	2	82	5262.20	17	1448		515084

Trial #	Burst Number	Number of Pulses	Pulse Width [µs]	Radar frequency [MHz]	Chirp Width [MHz]	Pulse 1-to-2 Spacing [µs]	Pulse 2-to-3 Spacing [µs]	Starting Location Within Interval [µs]
24	1	1	79	5267.00	5			502
	2	2	76	5267.00	5	1924		2183113
	3	3	68	5267.00	5	1773	1157	1148688
	4	2	84	5267.00	5	1484		2502453
	5	1	95	5267.00	5			1454807
	6	3	79	5267.00	5	1997	1559	1134376
	7	3	76	5267.00	5	1350	1169	1550779
	8	3	81	5267.00	5	1100	1556	1703843

Trial #	Burst Number	Number of Pulses	Pulse Width [µs]	Radar frequency [MHz]	Chirp Width [MHz]	Pulse 1-to-2 Spacing [µs]	Pulse 2-to-3 Spacing [µs]	Starting Location Within Interval [µs]
25	1	1	98	5261.80	18			431
	2	2	98	5261.80	18	1178		849435
	3	3	87	5261.80	18	1853	1983	459700
	4	3	89	5261.80	18	1074	1112	1185778
	5	1	86	5261.80	18			512876
	6	2	88	5261.80	18	1547		328173
	7	2	58	5261.80	18	1445		505282
	8	3	65	5261.80	18	1419	1187	1145875
	9	2	64	5261.80	18	1795		460122
	10	3	64	5261.80	18	1277	1934	726329
	11	1	62	5261.80	18			440112
	12	2	99	5261.80	18	1831		402135
	13	1	89	5261.80	18			778155
	14	2	92	5261.80	18	1973		570489
	15	2	50	5261.80	18	1037		686197
	16	3	80	5261.80	18	1706	1594	910467
	17	3	96	5261.80	18	1157	1220	608542
	18	3	62	5261.80	18	1079	1188	269524
	19	3	59	5261.80	18	1216	1955	819034

Trial #	Burst Number	Number of Pulses	Pulse Width [µs]	Radar frquency [MHz]	Chirp Width [MHz]	Pulse 1-to-2 Spacing [µs]	Pulse 2-to-3 Spacing [µs]	Starting Location Within Interval [µs]
26	1	2	90	5266.20	7	1000		21406
	2	2	70	5266.20	7	1156		1188007
	3	2	53	5266.20	7	1457		417766
	4	2	91	5266.20	7	1269		842201
	5	3	57	5266.20	7	1573	1384	733907
	6	1	69	5266.20	7			1350470
	7	1	66	5266.20	7			935075
	8	3	72	5266.20	7	1061	1122	834287
	9	1	91	5266.20	7			245451
	10	3	73	5266.20	7	1879	1073	1015693
	11	2	74	5266.20	7	1042		983968
	12	3	52	5266.20	7	1321	1985	819245
	13	2	66	5266.20	7	1339		506276
	14	3	68	5266.20	7	1432	1190	1129842
	15	2	88	5266.20	7	1938		611901

Trial #	Burst Number	Number of Pulses	Pulse Width [µs]	Radar frequency [MHz]	Chirp Width [MHz]	Pulse 1-to-2 Spacing [µs]	Pulse 2-to-3 Spacing [µs]	Starting Location Within Interval [µs]
27	1	3	67	5264.20	12	1773	1879	269482
	2	2	87	5264.20	12	1770		720468
	3	1	89	5264.20	12			797601
	4	1	68	5264.20	12			651494
	5	1	65	5264.20	12			565157
	6	2	73	5264.20	12	1873		498073
	7	1	90	5264.20	12			863911
	8	2	64	5264.20	12	1019		406868
	9	2	71	5264.20	12	1300		761799
	10	3	97	5264.20	12	1328	1160	656499
	11	2	62	5264.20	12	1616		132027
	12	3	64	5264.20	12	1511	1858	685294
	13	3	75	5264.20	12	1481	1791	920101
	14	3	52	5264.20	12	1790	1634	713137
	15	2	55	5264.20	12	1917		614654
	16	1	60	5264.20	12			420541
	17	2	58	5264.20	12	1016		1014903
	18	1	93	5264.20	12			308080
	19	2	92	5264.20	12	1550		646622

Trial #	Burst Number	Number of Pulses	Pulse Width [µs]	Radar frequency [MHz]	Chirp Width [MHz]	Pulse 1-to-2 Spacing [µs]	Pulse 2-to-3 Spacing [µs]	Starting Location Within Interval [µs]
28	1	3	77	5261.00	20	1742	1027	263870
	2	3	58	5261.00	20	1034	1090	1207853
	3	3	74	5261.00	20	1406	1033	712438
	4	3	68	5261.00	20	1166	1872	663182
	5	1	54	5261.00	20			418405
	6	1	59	5261.00	20			677857
	7	1	99	5261.00	20			752458
	8	3	76	5261.00	20	1011	1212	697503
	9	3	58	5261.00	20	1102	1506	1236513
	10	1	61	5261.00	20			794155
	11	1	82	5261.00	20			749688
	12	1	67	5261.00	20			786670
	13	3	88	5261.00	20	1786	1768	378812
	14	2	89	5261.00	20	1974		672301
	15	3	57	5261.00	20	1317	1099	880204
	16	2	53	5261.00	20	1301		575247

Trial #	Burst Number	Number of Pulses	Pulse Width [µs]	Radar frequency [MHz]	Chirp Width [MHz]	Pulse 1-to-2 Spacing [µs]	Pulse 2-to-3 Spacing [µs]	Starting Location Within Interval [µs]
29	1	2	59	5265.80	8	1000		714854
	2	1	68	5265.80	8			987552
	3	2	89	5265.80	8	1833		1903299
	4	1	94	5265.80	8			639651
	5	2	66	5265.80	8	1539		1459640
	6	3	68	5265.80	8	1639	1521	1599170
	7	2	97	5265.80	8	1102		1142720
	8	1	78	5265.80	8			963689
	9	1	98	5265.80	8			2019679

Trial #	Burst Number	Number of Pulses	Pulse Width [µs]	Radar frequency [MHz]	Chirp Width [MHz]	Pulse 1-to-2 Spacing [µs]	Pulse 2-to-3 Spacing [µs]	Starting Location Within Interval [µs]
30	1	3	69	5263.00	15	1339	1381	222494
	2	1	70	5263.00	15			1119349
	3	3	56	5263.00	15	1660	1444	685457
	4	2	73	5263.00	15	1710		868924
	5	2	100	5263.00	15	1536		340684
	6	3	93	5263.00	15	1652	1731	1136450
	7	2	55	5263.00	15	1629		190418
	8	1	79	5263.00	15			1024554
	9	2	97	5263.00	15	1504		844764
	10	2	87	5263.00	15	1658		580134
	11	2	73	5263.00	15	1719		1019178
	12	3	63	5263.00	15	1220	1669	922750
	13	3	58	5263.00	15	1030	1034	744379
	14	1	69	5263.00	15			48331
	15	3	79	5263.00	15	1218	1069	1073458
	16	1	93	5263.00	15			1016043

Parameter Data sheet for Radar Type 6

5260 MHz (11n HT20)

Trial #	Hopping Number	Start Time	Frequency [MHz]
1	32	93	5250
	34	99	5265
	84	249	5251

Trial #	Hopping Number	Start Time	Frequency [MHz]
2	12	33	5259
	19	54	5251
	25	72	5266
	29	84	5253
	84	249	5261

Trial #	Hopping Number	Start Time	Frequency [MHz]
3	31	90	5251
	83	246	5269

Trial #	Hopping Number	Start Time	Frequency [MHz]
4	74	219	5252
	82	243	5267

Trial #	Hopping Number	Start Time	Frequency [MHz]
5	24	69	5259
	32	93	5265
	50	147	5261

Trial #	Hopping Number	Start Time	Frequency [MHz]
6	42	123	5268
	46	135	5255
	78	231	5258

Trial #	Hopping Number	Start Time	Frequency [MHz]
7	20	57	5251
	38	111	5257
	94	279	5264

Trial #	Hopping Number	Start Time	Frequency [MHz]
8	41	120	5254
	44	129	5250
	58	171	5270
	67	198	5262
	70	207	5259
	78	231	5258

Trial #	Hopping Number	Start Time	Frequency [MHz]
9	4	9	5252
	17	48	5263
	33	96	5253
	47	138	5270
	60	177	5260
	92	273	5259

Trial #	Hopping Number	Start Time	Frequency [MHz]
10	51	150	5268
	62	183	5266
	65	192	5257
	66	195	5261
	75	222	5259

Trial #	Hopping Number	Start Time	Frequency [MHz]
11	46	135	5266
	66	195	5263
	88	261	5262
	94	279	5256

Trial #	Hopping Number	Start Time	Frequency [MHz]
12	3	6	5251
	21	60	5268
	32	93	5264
	45	132	5250
	48	141	5258
	88	261	5252
	96	285	5269

Trial #	Hopping Number	Start Time	Frequency [MHz]
13	21	60	5267
	40	117	5262
	42	123	5250
	64	189	5256
	100	297	5254

Trial #	Hopping Number	Start Time	Frequency [MHz]
14	31	90	5256
	76	225	5262
	92	273	5267

Trial #	Hopping Number	Start Time	Frequency [MHz]
15	6	15	5256
	26	75	5270
	65	192	5260
	99	294	5255

Trial #	Hopping Number	Start Time	Frequency [MHz]
16	6	15	5264
	21	60	5251
	40	117	5256
	64	189	5261
	100	297	5269

Trial #	Hopping Number	Start Time	Frequency [MHz]
17	20	57	5255
	63	186	5269
	65	192	5258

Trial #	Hopping Number	Start Time	Frequency [MHz]
18	12	33	5270
	27	78	5256
	39	114	5253
	48	141	5263
	66	195	5259
	82	243	5264

Trial #	Hopping Number	Start Time	Frequency [MHz]
19	71	210	5270
	92	273	5266

Trial #	Hopping Number	Start Time	Frequency [MHz]
20	9	24	5256
	15	42	5259
	70	207	5265
	91	270	5270
	94	279	5268

Trial #	Hopping Number	Start Time	Frequency [MHz]
21	15	42	5251
	27	78	5270
	52	153	5254
	63	186	5255
	64	189	5256
	68	201	5250

Trial #	Hopping Number	Start Time	Frequency [MHz]
22	24	69	5261
	40	117	5250
	46	135	5269
	57	168	5255
	60	177	5252
	67	198	5264
	99	294	5253

Trial #	Hopping Number	Start Time	Frequency [MHz]
23	91	69	5258
	96	72	5253

Trial #	Hopping Number	Start Time	Frequency [MHz]
24	28	81	5268
	37	84	5261

Trial #	Hopping Number	Start Time	Frequency [MHz]
25	44	129	5251
	62	183	5258
	67	198	5252
	70	207	5256
	77	228	5250

Trial #	Hopping Number	Start Time	Frequency [MHz]
26	38	111	5265
	59	174	5254
	60	177	5258
	68	201	5262

Trial #	Hopping Number	Start Time	Frequency [MHz]
27	5	12	5252
	11	30	5263
	26	75	5267
	33	96	5256
	36	105	5260
	64	189	5265

Trial #	Hopping Number	Start Time	Frequency [MHz]
28	24	69	5270
	26	75	5252
	95	282	5253

Trial #	Hopping Number	Start Time	Frequency [MHz]
29	10	27	5265
	25	72	5251
	33	96	5253
	51	150	5255

Trial #	Hopping Number	Start Time	Frequency [MHz]
30	18	51	5252
	28	81	5256
	85	252	5268
	90	267	5261
	98	291	5253

APPENDIX 2: Test instruments

EMI Test Equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
SSG-01	Signal Generator	Agilent	E4438C	MY47271584	DFS	2017/03/06 * 12
SCC-G14	Coaxial Cable	Suhner	SUCOFLEX 102	31600/2	DFS	2017/03/23 * 12
SPSC-07	Power Splitters/Combiners	Mini-Circuits	ZFSC-2-10G+	-	DFS	2016/07/28 * 12
SCC-G29	Coaxial Cable	Junkosha	MWX241-01000KMSKMS	SEP-20-12-003	DFS	-
SRENT-09	Spectrum Analyzer	Agilent	E4440A	MY46186392	DFS	2016/11/01 * 12
SCC-G24	Coaxial Cable	Suhner	141PE	-	DFS	2016/07/27 * 12
SAT10-14	Attenuator	Weinschel Corp.	54A-10	81595	DFS	2017/04/20 * 12
SAT20-02	Attenuator	Agilent	8493C-020	74890	DFS	2017/03/23 * 12
SAT20-03	Attenuator	Agilent	8493C-020	74891	DFS	2017/03/23 * 12
SPSC-08	Power Splitters/Combiners	Mini-Circuits	ZFSC-2-10G+	-	DFS	2016/07/28 * 12
SAT20-05	Attenuator	Weinschel Corp.	54A-20	Y5649	DFS	2016/11/07 * 12
SAT20-06	Attenuator	Weinschel Corp.	54A-20	31506	DFS	2017/04/20 * 12
SAT20-07	Attenuator	Weinschel Corp.	54A-20	31484	DFS	2017/04/20 * 12
SCC-G26	Coaxial Cable	Suhner	141PE	-	DFS	2016/07/27 * 12
SCC-G25	Coaxial Cable	Suhner	141PE	-	DFS	2016/07/27 * 12
COTS-SDFS-01	Signal Studio Software for DFS	Agilent	N7620A-101	5010-7739	DFS	-
SOS-09	Humidity Indicator	A&D	AD-5681	4061484	DFS	2016/12/13 * 12
STS-05	Digital Hitester	Hioki	3805-50	080997828	DFS	2016/10/17 * 12

***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.
All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.
As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibrations.

Test Item:

DFS: Dynamic Frequency Selection