

Project No.: TM-2405000351P  
Report No.: TMWK2405001685KR

FCC ID: W2Z-01000016  
IC: 7736B-01000016

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# CLASS II PERMISSIVE CHANGE

## FCC 47 CFR PART 15 SUBPART E

### INDUSTRY CANADA RSS-247

<b>Test Standard</b>	<b>FCC Part 15.407 + IC RSS-247 issue 3 and IC RSS-GEN issue 5</b>
<b>Product name</b>	<b>Flat Panel Sensor</b>
<b>Brand Name</b>	<b>FUJIFILM</b>
<b>Model</b>	<b>DR-ID 1284SE, DR-ID 1281SE, DR-ID 1282SE, DR-ID 1283SE, DR-ID 1285SE</b>
<b>Test Result</b>	<b>Pass</b>
<b>Statements of Conformity</b>	<b>Determination of compliance is based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.</b>

The test Result was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were given in ANSI C63.10: 2013 and compliance standards.

The test results of this report relate only to the tested sample (EUT) identified in this report.

The test Report of full or partial shall not copy. Without written approval of Compliance Certification Services Inc.(Wugu Laboratory)

Approved by:



Shawn Wu  
Supervisor

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.  
除非另有說明，此報告結果僅對測試之樣品負責，同時此樣品僅保留90天。本報告未經本公司書面許可，不可部份複製。

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## **Revision History**

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	July 9, 2024	Initial Issue	ALL	Peggy Tsai



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## 1. GENERAL INFORMATION

### 1.1 EUT INFORMATION

<b>Applicant</b>	<b>FCC:</b> Fuji Film Corporation 7-3, AKASAKA 9-CHOME, MINATO-KU, Tokyo, 107-0052 Japan <b>IC:</b> FUJIFILM Corporation 9-7-3 Akasaka Minato-ku Tokyo 107-0052 Japan
<b>Manufacturer</b>	<b>FCC:</b> Fuji Film Corporation 7-3, AKASAKA 9-CHOME, MINATO-KU, Tokyo, 107-0052 Japan <b>IC:</b> FUJIFILM Corporation 9-7-3 Akasaka Minato-ku Tokyo 107-0052 Japan
<b>Equipment</b>	Flat Panel Sensor
<b>Model</b>	DR-ID 1284SE, DR-ID 1281SE, DR-ID 1282SE, DR-ID 1283SE, DR-ID 1285SE
<b>Model Discrepancy</b>	Please see remark as below.
<b>Brand Name</b>	<b>FUJIFILM</b>
<b>Received Date</b>	May 22, 2024
<b>Date of Test</b>	May 23, 2024
<b>Power Supply</b>	1. EUT power from power box / power supply unit: 22-25VDC. 2. EUT power from battery: 11.4VDC.
<b>PMN</b>	FLAT PANEL SENSOR
<b>Serial number</b>	SE-V3-01
<b>HW Version</b>	v2
<b>SW Version</b>	v120.253
<b>Class II Permissive Change</b>	Added evaluation of WIFI 5G Band2 and Band3.



**Remark:**

1. For more details, please refer to the User's manual of the EUT.
2. Disclaimer: Antenna information is provided by the applicant, test results of this report are applicable to the sample EUT received.
3. Disclaimer: Variant information between/among model numbers is provided by the applicant, test results of this report are applicable to the sample EUT received of main test model name.
4. Model Discrepancy:

Model	Main	Series Model			
	DR-ID 1284SE	DR-ID 1282SE	DR-ID 1283SE	DR-ID 1281SE	DR-ID 1285SE
<b>Power Consumption</b>	45 W	45 W	40W	40 W	40 W
<b>PCB Layout / Circuit Diagram / Components</b>	has 12 gate ICs	has 12 gate ICs	has 12 gate ICs	has 12 gate ICs	has 7 gate ICs
	has 12 ROICs	has 12 ROICs	has 10 ROICs	has 10 ROICs	has 8 ROICs
<b>Size (Width(mm))* Length (mm)* Height (mm) / Appearance</b>	460*460*15 / 17'X17'	460*460*15 / 17'X17'	460*383*15 / 14'X17'	460*383*15 / 14'X17'	333*282*15 / 10'X12'
<b>Scintillator</b>	Csl	GOS	Csl	GOS	Csl
<b>Antenna</b>	PC143.54.0515A	PC143.54.0515A	PC143.54.0515A	PC143.54.0515A	PC143.54.0515A & PC143.54.0360A

5. Due to testing under DR-ID 1284SE that is the worst conditions, the results of this test are valid for DR-ID 1281SE, DR-ID 1282SE, DR-ID 1283SE, DR-ID 1285SE.

## 1.2 EUT CHANNEL INFORMATION

Frequency Range	<b>UNII-2a</b>	
	IEEE 802.11a	5260 ~ 5320 MHz
	IEEE 802.11n HT20	5260 ~ 5320 MHz
	IEEE 802.11ac VHT20	5260 ~ 5320 MHz
	IEEE 802.11n HT40	5270 ~ 5310 MHz
	IEEE 802.11ac VHT40	5270 ~ 5310 MHz
	IEEE 802.11ac VHT80	5290 MHz
	IEEE 802.11ax HE 20	5260 ~ 5320 MHz
	IEEE 802.11ax HE 40	5270 ~ 5310 MHz
	IEEE 802.11ax HE 80	5290 MHz
	<b>UNII-2c</b>	
	IEEE 802.11a	5500 ~ 5700 MHz
	IEEE 802.11n HT20	5500 ~ 5700 MHz
	IEEE 802.11ac VHT20	5500 ~ 5700 MHz
	IEEE 802.11n HT40	5510 ~ 5670 MHz
	IEEE 802.11ac VHT40	5510 ~ 5670 MHz
	IEEE 802.11ac VHT80	5530 ~ 5610 MHz
	IEEE 802.11ax HE 20	5500 ~ 5700 MHz
	IEEE 802.11ax HE 40	5510 ~ 5670 MHz
	IEEE 802.11ax HE 80	5530 ~ 5610 MHz
Modulation Type	<ol style="list-style-type: none"> <li>1. IEEE 802.11a mode: OFDM</li> <li>2. IEEE 802.11n HT 20 mode: OFDM</li> <li>3. IEEE 802.11n HT 40 mode: OFDM</li> <li>4. IEEE 802.11ac VHT 20 mode: OFDM</li> <li>5. IEEE 802.11ac VHT 40 mode: OFDM</li> <li>6. IEEE 802.11ac VHT 80 mode: OFDM</li> <li>7. IEEE 802.11ax HE 20 mode: OFDMA</li> <li>8. IEEE 802.11ax HE 40 mode: OFDMA</li> <li>9. IEEE 802.11ax HE 80 mode: OFDMA</li> </ol>	

**Remark:**

1. Refer as ANSI C63.10: 2013 clause 5.6.1 Table 4 for test channels
2. For Canada the EUT Frequency Range 5600~5650MHz will be disabled.

Number of frequencies to be tested		
Frequency range in which device operates	Number of frequencies	Location in frequency range of operation
<input type="checkbox"/> 1 MHz or less	1	Middle
<input type="checkbox"/> 1 MHz to 10 MHz	2	1 near top and 1 near bottom
<input checked="" type="checkbox"/> More than 10 MHz	3	1 near top, 1 near middle, and 1 near bottom

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### 1.3 ANTENNA INFORMATION

<b>Antenna Specification</b>	<input type="checkbox"/> PIFA <input checked="" type="checkbox"/> PCB <input type="checkbox"/> Dipole <input type="checkbox"/> Coils
<b>Antenna Gain</b>	Manufacturer:TAOGLAS (1) PC143.54.0515A 5250~5350: Gain: 0.64 dBi 5470~5725: Gain: 0.64 dBi (2) PC143.54.0360A 5250~5350: Gain: -1.62 dBi 5470~5725: Gain: -1.62 dBi
<b>Antenna connector</b>	IPEX MHF4L(M)

**Notes:**

1. Power Directional Gain:  $10\text{LOG}(((10^{\text{Ant1}/10})+10^{\text{Ant2}/10}))/2)$
- 2.The antenna(s) of the EUT are permanently attached and there are no provisions for connection to an external antenna. So the EUT complies with the requirements of §15.203.

### 1.4 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
Channel Bandwidth	± 2.7 %
RF output power (Spectrum)	± 2.440 dB
Power Spectral density	± 2.739 dB

**Remark:**

- 1.This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2
2. ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report.



## 1.5 FACILITIES AND TEST LOCATION

All measurement facilities used to collect the measurement data are located at

No.11, Wugong 6th Rd., Wugu Dist., New Taipei City, Taiwan.

CAB identifier: TW1309

Test site	Test Engineer	Remark
DFS	KW Huang	-

**Remark:** The lab has been recognized as the FCC accredited lab. under the KDB 974614 D01 and is listed in the FCC public Access Link (PAL) database, FCC Registration No. :444940, the FCC Designation No.:TW1309

## 1.6 INSTRUMENT CALIBRATION

DFS Test					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
EXA Signal Analyzer	Keysight	N9010A	MY54200716	2023-10-13	2024-10-12
Attenuator	E-INSTRUMENT	EPA-600H	EC1400050	2023-06-13	2024-06-12
Vector Signal Generator	KEYSIGHT	N5182B/N5182BX 07	MY61252828/ MY59362552	2024-01-19	2025-01-18
Power Divider	Marvelous	MVE8586	16011202	2023-06-16	2024-06-15
Power Divider	Marvelous	MVE8586	16011205	2023-06-16	2024-06-15
Power Divider	Marvelous	MVE8586	16011206	2023-07-04	2024-07-03
Power Divider	Solvang	STI08-0015	009	2023-07-11	2024-07-10
Cable	Woken	SUMITOMO	1	2024-03-02	2025-03-01
Cable	Woken	SUMITOMO	2	2024-03-02	2025-03-01
Cable	Woken	SUMITOMO	3	2024-03-02	2025-03-01
Cable	Woken	SUMITOMO	4	2024-03-02	2025-03-01
Cable	Woken	SUMITOMO	5	2024-03-02	2025-03-01
Cable	Woken	SUMITOMO	8	2024-03-02	2025-03-01
Cable	Woken	SUMITOMO	9	2024-03-02	2025-03-01
Cable	Woken	SUMITOMO	10	2024-03-02	2025-03-01
Cable	Woken	SUMITOMO	11	2024-03-02	2025-03-01
Cable	Woken	SUMITOMO	12	2024-03-02	2025-03-01
Cable	Woken	SUMITOMO	13	2024-03-02	2025-03-01
<b>Software</b>	Dynamic Frequency Selection Test version 23.12.07				

**Remark:**

1. Each piece of equipment is scheduled for calibration once a year.
2. N.C.R. = No Calibration Required.





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## 1.7 SUPPORT AND EUT ACCESSORIES EQUIPMENT

DFS_Sup_Units					
Name of	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
NB	Lenovo	TP00075A	N/A	N/A	N/A
NB	Lenovo	TP00096A	N/A	N/A	N/A
AP	ASUS	RT-AX88U	N/A	N/A	N/A

## 1.8 TEST PROGRAM

This EUT uses " Fujifilm Service Tool v.1.1.0" software and setup command to set the frequency, modulation, and power to allow the sample to continuously transmit.

## 1.9 TEST METHODOLOGY AND APPLIED STANDARDS

The test methodology, setups and results comply with all requirements in accordance with ANSI C63.10:2013, FCC Part 2, FCC Part 15.407, KDB 789033 D02, KDB 905462 D02, RSS-247 Issue 3 and RSS-GEN Issue 5.



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## 2. TEST SUMMERY

IC Standard Sec.	FCC Standard Sec.	Chapter	Test Item	Result
RSS-Gen (6.8)	15.203	1.3	Antenna Requirement	Pass
RSS-247(6.3)	15.407(h)	4.1	Dynamic Frequency Selection	Pass

### 3. DESCRIPTION OF TEST MODES

#### 3.1 THE WORST MODE OF OPERATING CONDITION

<p>Operation mode</p>	<ol style="list-style-type: none"> <li>1. IEEE 802.11a mode: 6Mbps</li> <li>2. IEEE 802.11n HT 20 MHz mode: MCS0</li> <li>3. IEEE 802.11n HT 40 MHz mode: MCS0</li> <li>4. IEEE 802.11ac VHT 20 MHz mode: MCS0</li> <li>5. IEEE 802.11ac VHT 40 MHz mode: MCS0</li> <li>6. IEEE 802.11ac VHT 80 MHz mode: MCS0</li> <li>7. IEEE 802.11ax HE 20 mode: MCS0</li> <li>8. IEEE 802.11ax HE 40 mode: MCS0</li> <li>9. IEEE 802.11ax HE 80 mode: MCS0</li> </ol>																																								
<p>Operating Frequency Range &amp; Number of Channels</p>		<table border="1"> <thead> <tr> <th data-bbox="724 824 1054 869">Mode</th> <th data-bbox="724 824 1054 869">Frequency Range (MHz)</th> </tr> </thead> <tbody> <tr> <td data-bbox="724 869 1054 902">IEEE 802.11a</td> <td data-bbox="724 869 1054 902">5260, 5300, 5320</td> </tr> <tr> <td data-bbox="724 902 1054 936">IEEE 802.11n HT 20</td> <td data-bbox="724 902 1054 936">5260, 5300, 5320</td> </tr> <tr> <td data-bbox="724 936 1054 969">IEEE 802.11n HT 40</td> <td data-bbox="724 936 1054 969">5270, 5310</td> </tr> <tr> <td data-bbox="724 969 1054 1003">IEEE 802.11ac VHT 20</td> <td data-bbox="724 969 1054 1003">5260, 5300, 5320</td> </tr> <tr> <td data-bbox="724 1003 1054 1037">IEEE 802.11ac VHT 40</td> <td data-bbox="724 1003 1054 1037">5270, 5310</td> </tr> <tr> <td data-bbox="724 1037 1054 1070">IEEE 802.11ac VHT 80</td> <td data-bbox="724 1037 1054 1070">5290</td> </tr> <tr> <td data-bbox="724 1070 1054 1104">IEEE 802.11ax HE 20</td> <td data-bbox="724 1070 1054 1104">5260, 5300, 5320</td> </tr> <tr> <td data-bbox="724 1104 1054 1137">IEEE 802.11ax HE 40</td> <td data-bbox="724 1104 1054 1137">5270, 5310</td> </tr> <tr> <td data-bbox="724 1137 1054 1171">IEEE 802.11ax HE 80</td> <td data-bbox="724 1137 1054 1171">5290</td> </tr> <tr> <td data-bbox="724 1171 1054 1205">IEEE 802.11a</td> <td data-bbox="724 1171 1054 1205">5500, 5580, 5700</td> </tr> <tr> <td data-bbox="724 1205 1054 1238">IEEE 802.11n HT 20</td> <td data-bbox="724 1205 1054 1238">5500, 5580, 5700</td> </tr> <tr> <td data-bbox="724 1238 1054 1272">IEEE 802.11n HT 40</td> <td data-bbox="724 1238 1054 1272">5510, 5550, 5670</td> </tr> <tr> <td data-bbox="724 1272 1054 1305">IEEE 802.11ac VHT 20</td> <td data-bbox="724 1272 1054 1305">5500, 5580, 5700</td> </tr> <tr> <td data-bbox="724 1305 1054 1339">IEEE 802.11ac VHT 40</td> <td data-bbox="724 1305 1054 1339">5510, 5550, 5670</td> </tr> <tr> <td data-bbox="724 1339 1054 1373">IEEE 802.11ac VHT 80</td> <td data-bbox="724 1339 1054 1373">5530, 5610</td> </tr> <tr> <td data-bbox="724 1373 1054 1406">IEEE 802.11ax HE 20</td> <td data-bbox="724 1373 1054 1406">5500, 5580, 5700</td> </tr> <tr> <td data-bbox="724 1406 1054 1440">IEEE 802.11ax HE 40</td> <td data-bbox="724 1406 1054 1440">5510, 5550, 5670</td> </tr> <tr> <td data-bbox="724 1440 1054 1473">IEEE 802.11ax HE 80</td> <td data-bbox="724 1440 1054 1473">5530, 5610</td> </tr> </tbody> </table>	Mode	Frequency Range (MHz)	IEEE 802.11a	5260, 5300, 5320	IEEE 802.11n HT 20	5260, 5300, 5320	IEEE 802.11n HT 40	5270, 5310	IEEE 802.11ac VHT 20	5260, 5300, 5320	IEEE 802.11ac VHT 40	5270, 5310	IEEE 802.11ac VHT 80	5290	IEEE 802.11ax HE 20	5260, 5300, 5320	IEEE 802.11ax HE 40	5270, 5310	IEEE 802.11ax HE 80	5290	IEEE 802.11a	5500, 5580, 5700	IEEE 802.11n HT 20	5500, 5580, 5700	IEEE 802.11n HT 40	5510, 5550, 5670	IEEE 802.11ac VHT 20	5500, 5580, 5700	IEEE 802.11ac VHT 40	5510, 5550, 5670	IEEE 802.11ac VHT 80	5530, 5610	IEEE 802.11ax HE 20	5500, 5580, 5700	IEEE 802.11ax HE 40	5510, 5550, 5670	IEEE 802.11ax HE 80	5530, 5610	
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Remark:

1. EUT pre-scanned data rate of output power for each mode, the worst data rate were recorded in this report.



## 4. TEST RESULT

### 4.1 TEST LIMIT

FCC according to §15.407 (h), KDB 905462 D02 "compliance measurement procedures for unlicensed-national information infrastructure devices operating in the 5250-5350 MHz and 5470-5725 MHz bands incorporating dynamic frequency selection". and KDB 905462 D03 " U-NII client devices without radar detection capability.

IC according RSS-247 section 6.3, and it harmonized with FCC Part 15 DFS rules. The EIRP refer section 4.3 output power measurement in this report.

**Table 1: Applicability of DFS requirements prior to use of a channel**

Requirement	Operational Mode		
	Master	Client (without radar detection)	Client(with radar detection)
<b>Non-Occupancy Period</b>	Yes	Not required	Yes
<b>DFS Detection Threshold</b>	Yes	Not required	Yes
<b>Channel Availability Check Time</b>	Yes	Not required	Not required
<b>U-NII Detection Bandwidth</b>	Yes	Not required	Yes

**Table 2: Applicability of DFS requirements during normal operation**

Requirement	Operational Mode	
	Master Device or Client with Radar Detection	Client Without Radar Detection
<b>DFS Detection Threshold</b>	Yes	Not required
<b>Channel Closing Transmission Time</b>	Yes	Yes
<b>Channel Move Time</b>	Yes	Yes
<b>U-NII Detection Bandwidth</b>	Yes	Not required

Additional requirements for devices with multiple bandwidth mods	Master Device or Client with Radar Detection	Client Without Radar Detection
U-NII Detection Bandwidth and Statistical Performance Check	All BW modes must be tested	Not required
Channel Move Time and Channel Closing Transmission Time	Test using widest BW mode available	Test using the widest BW mode available for the link
All other tests	Any single BW mode	Not required

Note: Frequencies selected for statistical performance check (Section 7.8.4) should include several frequencies within the radar detection bandwidth and frequencies near the edge of the radar detection bandwidth. For 802.11 devices it is suggested to select frequencies in each of the bonded 20 MHz channels and the channel center frequency.



**Table 3: Interference Threshold values, Master or Client incorporating In-Service**

Maximum Transmit Power	Value (See Notes 1, 2, and 3)
EIRP ≥ 200 milliwatt	-64 dBm
EIRP < 200 milliwatt and power spectral density < 10 dBm/MHz	-62 dBm
EIRP < 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 4: 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 signals 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 5 – Short Pulse Radar Test Waveforms**

Radar Type	Pulse Width (µsec)	PRI (µsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Number of Trials
0	1	1428	18	See Note 1	
1	1	Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in Table 5a	$\text{Roundup} \left\{ \left( \frac{1}{360} \cdot \frac{19 \cdot 10^6}{\text{PRI}_{\mu\text{sec}}} \right) \right\}$	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 (Radar Types 1-4)				80%	120
<b>Note 1:</b> Short Pulse Radar Type 0 should be used for the detection bandwidth test, channel move time, and channel closing time tests.					

**Table 6 – Long Pulse Radar Test Signal**

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

**Table 7 – Frequency Hopping Radar Test Signal**

Radar Type	Pulse Width (μsec)	PRI (μsec)	Pulses per Hop	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



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## 4.2 TEST PROCEDURE

### Overview Of EUT With Respect To §15.407 (H) Requirements

The firmware installed in the EUT during testing was:

**Firmware Rev: 10.0.19043.1586**

The EUT operates over the 5250-5350 MHz and 5470-5725 MHz range as a Client Device that does not have radar detection capability.

The EUT uses one transmitter connected to two 50-ohm coaxial antenna ports via a diversity switch. Only one antenna port is connected to the test system since the EUT has one antenna only.

The Slave device associated with the EUT during these tests does not have radar detection capability.

WLAN traffic is generated by streaming the video file TestFile.mp2 “6 ½ Magic Hours” from the Master to the Slave in full motion video mode using the media player with the V2.61 Codec package.

The minimum DFS detection threshold for devices with a maximum e.i.r.p. of 200 mW to 1 W is -64 dBm. For devices that operate with less than 200 mW eirp and a power spectral density of less than 10 dBm in a 1 MHz band, the minimum detection threshold is -62 dBm. The detection threshold is the received power averaged over 1 microsecond referenced to a 0 dBi antenna. For the initial channel setting, the manufacturers shall be permitted to provide for either random channel selection or manual channel selection.





## **TEST AND MEASUREMENT SYSTEM**

### **System Overview**

The measurement system is based on a conducted test method.

The short pulse and long pulse signal generating system utilizes the NTIA software. The Vector Signal Generator has been validated by the NTIA. The hopping signal generating system utilizes the CCS simulated hopping method and system, which has been validated by the DoD, FCC and NTIA. The software selects waveform parameters from within the bounds of the signal type on a random basis using uniform distribution.

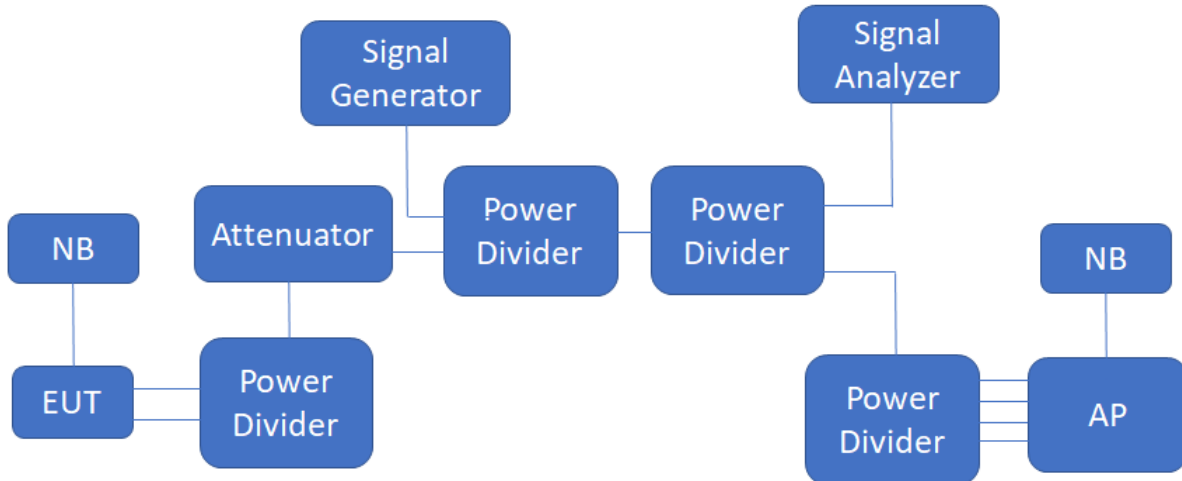
The short pulse types 2, 3 and 4, and the long pulse type 5 parameters are randomized at run-time.

The hopping type 6 pulse parameters are fixed while the hopping sequence is based on the August 2005 NTIA Hopping Frequency List. The initial starting point randomized at run-time and each subsequent starting point is incremented by 475. Each frequency in the 100-length segment is compared to the boundaries of the EUT Detection Bandwidth and the software creates a hopping burst pattern in accordance with Section 7.4.1.3 Method #2 Simulated Frequency Hopping Radar Waveform Generating Subsystem of FCC 06-96 APPENDIX. The frequency of the signal generator is incremented in 1 MHz steps from FL to FH for each successive trial. This incremental sequence is repeated as required to generate a minimum of 30 total trials and to maintain a uniform frequency distribution over the entire Detection Bandwidth.

The signal monitoring equipment consists of a spectrum analyzer set to display 8001 bins on the horizontal axis. The time-domain resolution is 2 msec / bin with a 16 second sweep time, meeting the 10 second 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 and max hold. The time-domain resolution is 3 msec / bin with a 24 second sweep time, meeting the 22 second long pulse reporting criteria and allowing a minimum of 10 seconds after the end of the long pulse waveform.

Should multiple RF ports be utilized for the Master and/or Slave devices (for example, for diversity or MIMO implementations), 50 ohm termination would be removed from the splitter so that connection can be established between splitter and the Master and/or Slave devices.

**Conducted Method System Block Diagram**



**System Calibration**

Connect the spectrum analyzer to the test system in place of the master device. Set the signal generator to CW mode. Adjust the amplitude of the signal generator to yield a measured level of  $-62$  dBm on the spectrum analyzer.

Without changing any of the instrument settings, reconnect the spectrum analyzer to the Common port of the Spectrum Analyzer Combiner/Divider and connect a 50 ohm load to the Master Device port of the test system.

Measure the amplitude and calculate the difference from  $-62$  dBm. Adjust the Reference Level Offset of the spectrum analyzer to this difference. Confirm that the signal is displayed at  $-62$  dBm. Readjust the RBW and VBW to 3 MHz, set the span to 10 MHz, and confirm that the signal is still displayed at  $-62$  dBm.

The spectrum analyzer displays the level of the signal generator as received at the antenna ports of the Master Device. The interference detection threshold may be varied from the calibrated value of  $-62$  dBm and the spectrum analyzer will still indicate the level as received by the Master Device.

Set the signal generator to produce a radar waveform, trigger a burst manually and measure the level 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.



### **Adjustment Of Displayed Traffic Level**

Establish a link between the Master and Slave, adjusting the Link Step Attenuator as needed to provide a suitable received level at the Master and Slave devices. Stream the video test file to generate WLAN traffic. Confirm that the WLAN traffic level, as displayed on the spectrum analyzer, is at lower amplitude than the radar detection threshold. Confirm that the displayed traffic is from the Master Device. For Master Device testing confirm that the displayed traffic does not include Slave Device traffic. For Slave Device testing confirm that the displayed traffic does not include Master Device traffic.

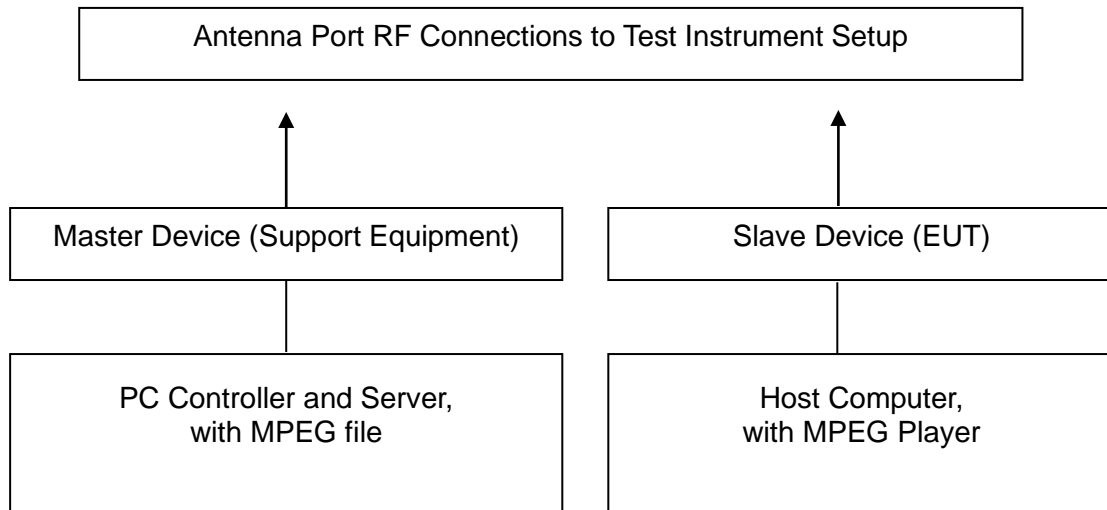
If a different setting of the Master Step Attenuator is required to meet the above conditions, perform a new System Calibration for the new Master Step Attenuator setting.

### **Channel Loading**

System testing will be performed with channel-loading using means appropriate to the data types that are used by the unlicensed device. The following requirements apply:

- a) The data file must be of a type that is typical for the device (i.e., MPEG-2, MPEG-4, WAV, MP3, MP4, AVI, etc.) and must generally be transmitting in a streaming mode.
- b) Software to ping the client is permitted to simulate data transfer but must have random ping intervals.
- c) Timing plots are required with calculations demonstrating a minimum channel loading of approximately 17% or greater. For example, channel loading can be estimated by setting the spectrum analyzer for zero span and approximate the Time On/ (Time On + Off Time). This can be done with any appropriate channel BW and modulation type.
- d) Unicast or Multicast protocols are preferable but other protocols may be used. The appropriate protocol used must be described in the test procedures.

### 4.3 TEST SETUP



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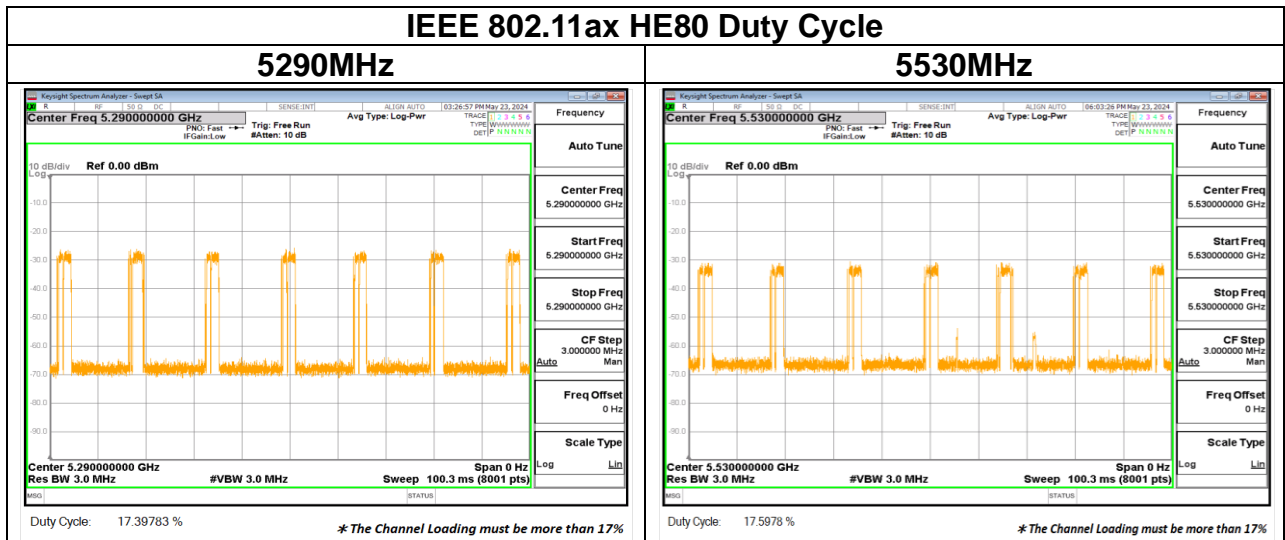
### 4.3.1 Test Result

Temperature: 24.3°C

Test date: May 23, 2024

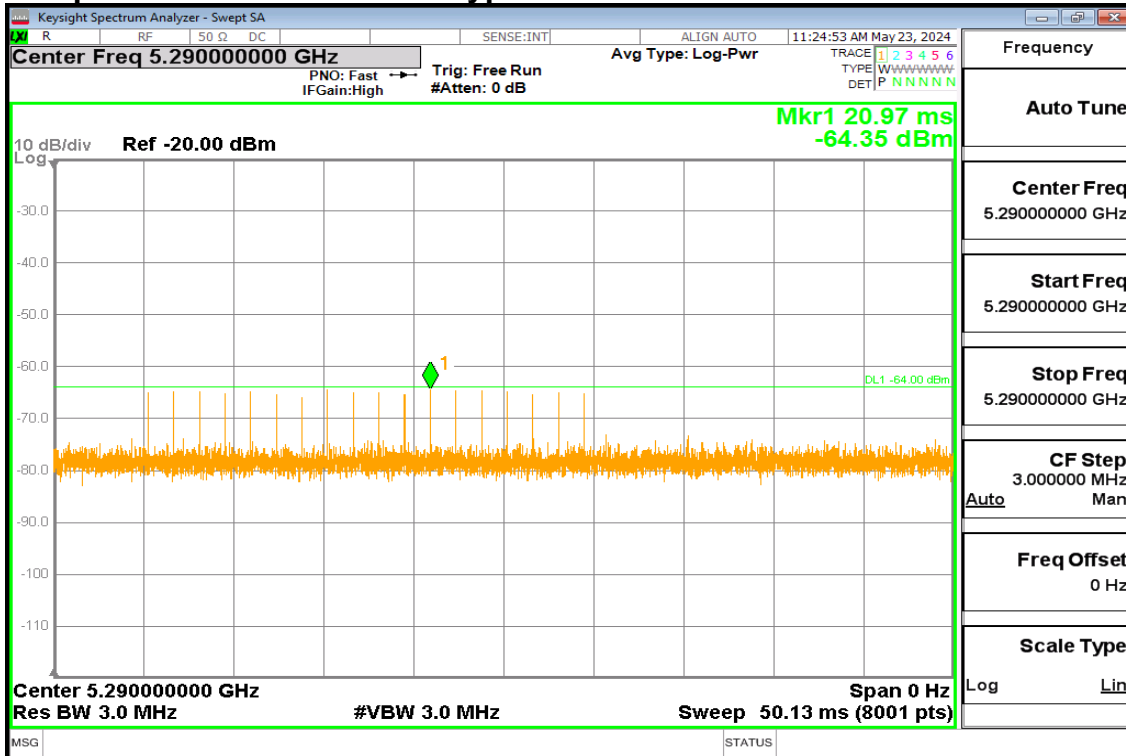
Humidity: 51% RH

Tested by: KW Huang



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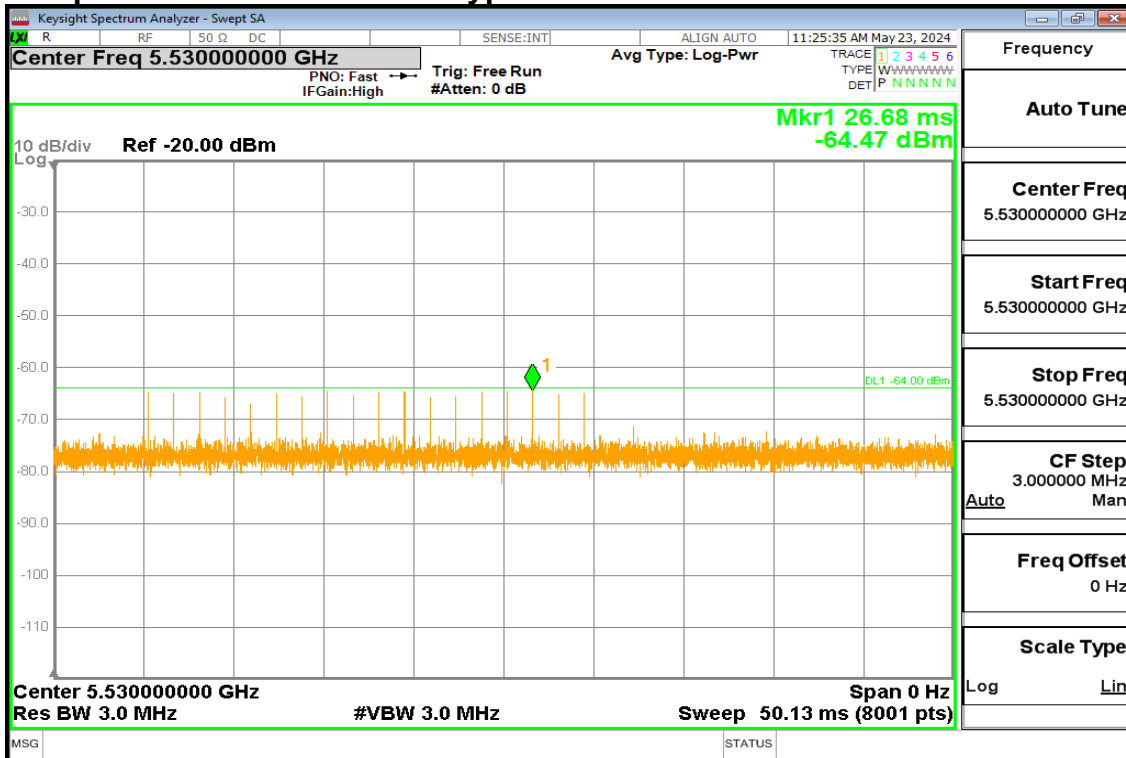
**PLOT OF WLAN TRAFFIC FROM SLAVE**  
**Band 2**  
**IEEE 802.11ac VHT80 mode / 5290 MHz**  
**Radar Waveforms**  
**Sample of short Pulse Radar Type 0**





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**Band 3**  
**IEEE 802.11ac VHT80 mode / 5530 MHz**  
**Radar Waveforms**  
**Sample of short Pulse Radar Type 0**





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## **TEST CHANNEL AND METHOD**

All tests were performed at a channel center frequency of 5290 MHz and 5530 MHz utilizing a conducted test method.

## **CHANNEL MOVE TIME AND CHANNEL CLOSING TRANSMISSION TIME**

### **GENERAL REPORTING NOTES**

The reference marker is set at the end of last radar pulse.

The delta marker is set at the end of the last WLAN transmission following the radar pulse. This delta is the channel move time.

The aggregate channel closing transmission time is calculated as follows:

Aggregate Transmission Time =

(Number of analyzer bins showing transmission) \* (dwell time per bin)

The observation period over which the aggregate time is calculated

Begins at (Reference Marker + 200 msec) and

Ends no earlier than (Reference Marker + 10 sec).





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**Type 0 Channel Move Time Results & Channel Closing Transmission Time Results**

Channel Shutdown Result				
Detection Threshold Level (dBm)			-64	
Modulation Mode	Freq. (MHz)	Radar Test Signal	Channel Closing Transmission Time(ms) 200ms~10sec	Channel Move Time(s)
Limit			60 ms	10 sec
Result			Complied	



