FCC/ISED - TEST REPORT

Report Number	:	**709502403822-00B Rev1**	Date of Issue:	October 31, 2024

Model	:	Lime-CCU23
Product Type	:	CCU
Applicant	:	Neutron Holdings, Inc.
Address	:	85 2nd St, San Francisco, CA 94105 USA
Manufacturer	:	Neutron Holdings, Inc.
Address	:	85 2nd St, San Francisco, CA 94105 USA

Test Result	:	■ **Positive**	☐ **Negative**
Total pages including Appendices	:	29	

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This revised report replaced all the version issued before.

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2 Details about the Test Laboratory

Details about the Test Laboratory
Test Site 1

Company name:	TÜV SÜD Certification and Testing (China) Co., Ltd. Shanghai Branch No.16 Lane, 1951 Du Hui Road, Shanghai 201108, P.R. China
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FCC Registration No.:	820234
FCC Designation Number:	CN1183
ISED CAB identifier	CN0101
IC Registration No.:	31668

3 Description of the Equipment under Test

Product:	CCU
Model no.:	Lime-CCU23
Hardware Version Identification No. (HVIN)	Lime-CCU23
Product Marketing Name (PMN)	Lime-CCU23
FCC ID:	2APB2-LIME-CCU23
IC:	32977-LIMECCU23
Options and accessories:	NA
Rating:	DC 42V/54V
RF Transmission Frequency:	For 2.4G Wi-Fi: For 802.11b/g/n-HT20: 2412~2462 MHz For 5G Wi-Fi: 5180~5240 MHz (U-NII-1) 5260~5320 MHz (U-NII-2A) 5500~5720 MHz (U-NII-2C) 5745~5825 MHz (U-NII-3) The device shall not be capable of transmitting in the 5600-5650 MHz band. For BLE (Module1): 2402~2480 MHz For EDR (Module1): 2402~2480 MHz For BLE (Module2): 2402~2480 MHz For EDR (Module2): 2402~2480 MHz
RF Transmission Frequency(DFS band):	5260~5320 MHz (U-NII-2A) 5500~5720 MHz (U-NII-2C)

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No. of Operated Channel:	For 2.4G Wi-Fi: 11 for 802.11b/802.11g/802.11n(H20) For 5G Wi-Fi: 5180~5240 MHz (U-NII-1) 5260~5320 MHz (U-NII-2A) 5500~5700 MHz (U-NII-2C) 5745~5825 MHz (U-NII-3) For BLE (Module1): 40 For EDR (Module1): 79 For BLE (Module2): 40 For EDR (Module2): 79
Modulation:	For 2.4G Wi-Fi: Direct Sequence Spread Spectrum (DSSS) for 802.11b Orthogonal Frequency Division Multiplexing (OFDM) for 802.11g/n For 5G Wi-Fi: Orthogonal Frequency Division Multiplexing (OFDM) for 802.11a/n/ac For BLE (Module1): GFSK For EDR (Module1): GFSK, π/4 DQPSK, 8DPSK For BLE (Module2): GFSK For EDR (Module2): GFSK, π/4 DQPSK, 8DPSK
Hardware Version:	EG21GGFR07A01M4G_OCPU_NCFG_QDM549_01.200.01.002
Software Version:	V1.2
Data speed:	For 2.4G Wi-Fi: 11b 1-11Mbps 11g 6-54Mbps 11n(H20) 6.5-72.2Mbps For 5G Wi-Fi: 11a 6 ~ 54Mbps, 11n HT20 6.5 ~ 72.2Mbps, 11ac VHT20 6.5 ~ 86.7Mbps, 11ac VHT40 13.5 ~ 200Mbps,

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11ac VHT80 29.3 ~ 433.3Mbps

For BLE (Module1): 1Mbps

For EDR (Module1): 1Mbps, 2Mbps, 3Mbps

For BLE (Module2): 1Mbps, 2Mbps

For EDR (Module2): 1Mbps, 2Mbps, 3Mbps

Channel list:

For 2.4G Wi-Fi:

802.11b/g/n(HT20)			
Ch	Fre(MHz)	Ch	Fre(MHz)
1	2412	7	2442
2	2417	8	2447
3	2422	9	2452
4	2427	10	2457
5	2432	11	2462
6	2437		

For 5G Wi-Fi:

Band (GHz)	Operating Channel Number	Channel center frequencies for 20MHz bandwidth (MHz)
5.15GHz~5.25GHz	36	5180
	40	5200
	44	5220
	48	5240
5.25GHz~5.35GHz	52	5260
	56	5280
	60	5300
	64	5320
5.5GHz~5.7GHz	100	5500
	104	5520
	108	5540
	112	5560
	116	5580
	132	5660
	136	5680
	140	5700
	144	5720
5.725GHz~5.825GHz	149	5745

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	153	5765
	157	5785
	161	5805
	165	5825

Band (GHz)	Operating Channel Number	Channel center frequencies for 40MHz bandwidth (MHz)
5.15GHz~5.25GHz	38	5190
	46	5230
5.25GHz~5.35GHz	54	5270
	62	5310
5.5GHz~5.7GHz	102	5510
	110	5550
	134	5670
	142	5710
5.725GHz~5.825GHz	151	5755
	159	5795

Band (GHz)	Operating Channel Number	Channel center frequencies for 80MHz bandwidth (MHz)
5.15GHz~5.25GHz	42	5210
5.25GHz~5.35GHz	58	5290
5.5GHz~5.7GHz	106	5530
	138	5690
5.725GHz~5.825GHz	155	5775

For BLE

Ch	Fre(MHz)	Ch	Fre(MHz)	Ch	Fre(MHz)	Ch	Fre(MHz)
0	2402	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	39	2480

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For EDR

Ch	Fre (MH)	Ch	Fre (MH)	Ch	Fre (MH)	Ch	Fre (MH)	Ch	Fre (MHz)
1	2402	17	2418	33	2434	49	2450	65	2466
2	2403	18	2419	34	2435	50	2451	66	2467
3	2404	19	2420	35	2436	51	2452	67	2468
4	2405	20	2421	36	2437	52	2453	68	2469
5	2406	21	2422	37	2438	53	2454	69	2470
6	2407	22	2423	38	2439	54	2455	70	2471
7	2408	23	2424	39	2440	55	2456	71	2472
8	2409	24	2425	40	2441	56	2457	72	2473
9	2410	25	2426	41	2442	57	2458	73	2474
10	2411	26	2427	42	2443	58	2459	74	2475
11	2412	27	2428	43	2444	59	2460	75	2476
12	2413	28	2429	44	2445	60	2461	76	2477
13	2414	29	2430	45	2446	61	2462	77	2478
14	2415	30	2431	46	2447	62	2463	78	2479
15	2416	31	2432	47	2448	63	2464	79	2480
16	2417	32	2433	48	2449	64	2465		

Antenna Type:

For 2.4G Wi-Fi: FPC

For 5G Wi-Fi: FPC

For BLE (Module1): FPC

For EDR (Module1): FPC

For BLE (Module2): FPC

For EDR (Module2): FPC

Antenna Gain:

For 2.4G Wi-Fi: 1.96 dBi

For 5G Wi-Fi: 3.52 dBi

For BLE (Module1): 1.96 dBi

For EDR (Module1): 1.96 dBi

For BLE (Module2): 3.16 dBi

For EDR (Module2): 3.16 dBi

Max EIRP: 18.09dBm(64.42mW)

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Description of the EUT:	The Equipment Under Test (EUT) is a CCU with Wi-Fi Module, BLE/EDR Module and LTE Module. The EUT support Wi-Fi operated at 2.4GHz and 5GHz.
Test sample no.:	SHA-843416-3 (Conducted sample)

The sample's mentioned in this report is/are submitted/ supplied/ manufactured by client. The laboratory therefore assumes no responsibility for accuracy of information on the brand name, model number, origin of manufacture, consignment, antenna gain or any information supplied.

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4 Summary of Test Standards

Test Standards	
FCC Part 15 Subpart E, 2021 Edition	PART 15 - RADIO FREQUENCY DEVICES Subpart E - Unlicensed National Information Infrastructure Devices
RSS-Gen Issue 5 Amendment 1	General Requirements for Compliance of Radio Apparatus
RSS-247 Issue 3	Digital Transmission Systems (DTSS), Frequency Hopping Systems (FHSS) and License-Exempt Local Area Network (LE-LAN) Devices

Test Method:
KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02
KDB 905462 D03 UNII Clients Without Radar Detection New Rules v01r02
ANSI C63.10-2013, American National Standard for Testing Unlicensed Wireless Devices

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5 Summary of Test Results

Technical Requirements				
FCC Part 15 Subpart E & RSS-247 Issue 3/RSS-Gen Issue 5; KDB 905462 D02				
Clause	Test	Test Result		
		Pass	Fail	N/A
15.407(h)(2); RSS-247 6.3; KDB 905462 D02 7.8.1	UNII Detection Bandwidth	☐	☐	☒
15.407(h)(2); RSS-247 6.3; KDB 905462 D02 7.8.2 Performance Requirement Check	Initial Channel Availability Check Time (CAC)	☐	☐	☒
	Radar Burst at the Beginning of the CAC	☐	☐	☒
	Radar Burst at the End of the CAC	☐	☐	☒
15.407(h)(2); RSS-247 6.3; KDB 905462 D02 7.8.3 In-Service Monitoring	Channel Move Time	☒	☐	☐
	Channel Closing Transmission Time	☒	☐	☐
	Non-Occupancy Period	☒	☐	☐
15.407; RSS-247 6.3; KDB 905462 D02 7.8.4	Statistical Performance Check	☐	☐	☒

Remark: The EUT is a Client Device without Radar Detection.

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6 General Remarks

Remarks

This submittal(s) (test report) is intended for FCC ID: 2APB2-LIME-CCU23, IC: 32977-LIMECCU23, complies with DFS requirement in FCC Part 15 Subpart E and RSS-247, RSS-GEN.

SUMMARY:

All tests according to the regulations cited on page 10 were

■ - Performed

☐ - **Not** Performed

The Equipment under Test

■ - **Fulfills** the general approval requirements.

☐ - **Does not** fulfill the general approval requirements.

Sample Received Date:	June 19, 2024
Testing Start Date:	August 21, 2024
Testing End Date:	August 21, 2024

- TÜV SÜD Certification and Testing (China) Co., Ltd. Shanghai Branch

Reviewed by:	Prepared by:	Tested by:
Hui TONG	Wenqiang LU	Chengjie GUO
Review Engineer	Project Engineer	Test Engineer

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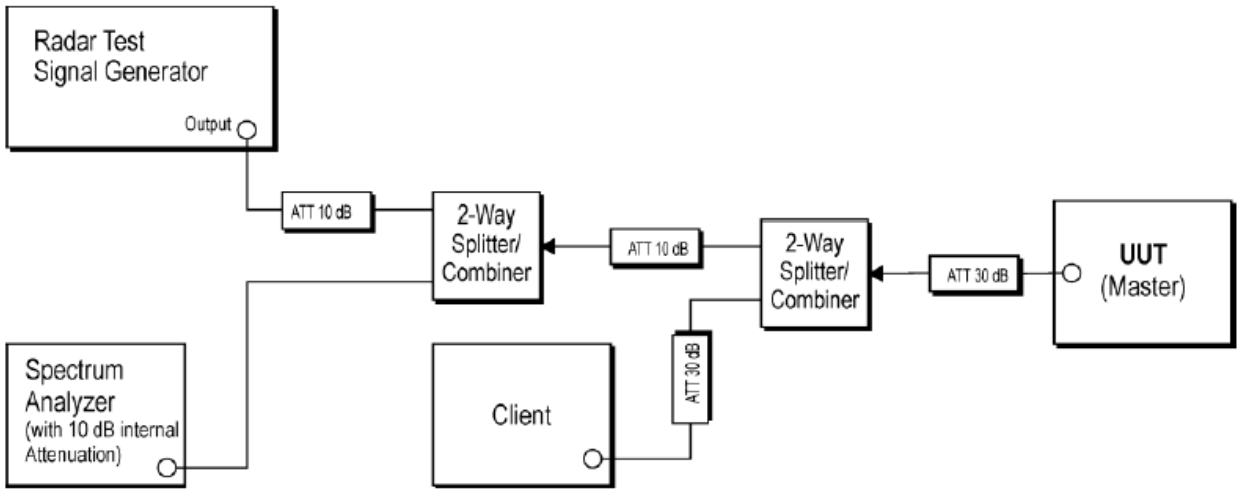
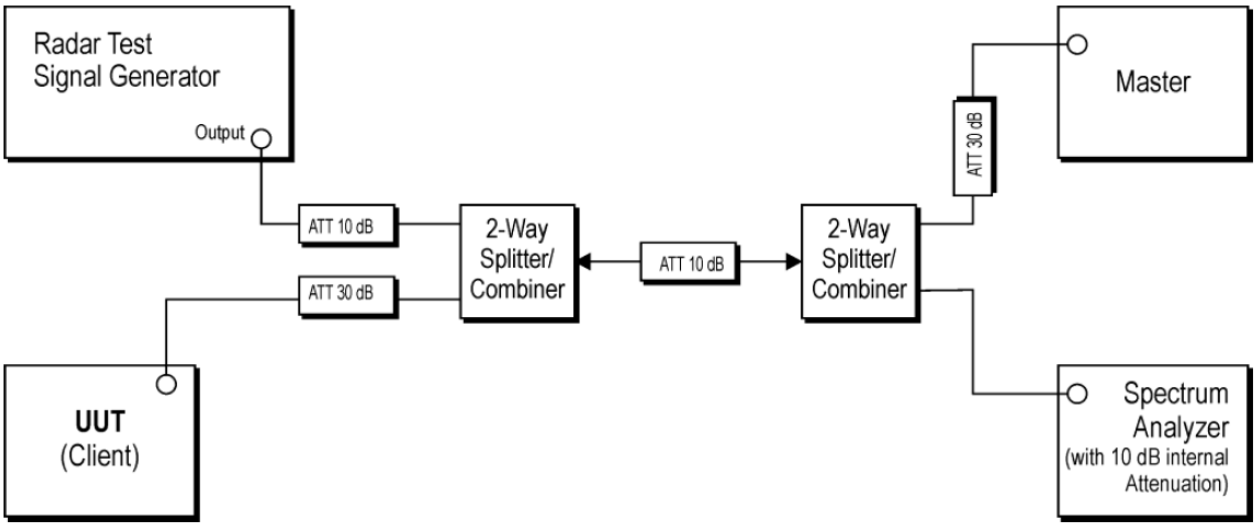
7 Test Setups

7.1 Setup for Master with injection at the Master



7.2 Setup for Client with injection at the Master



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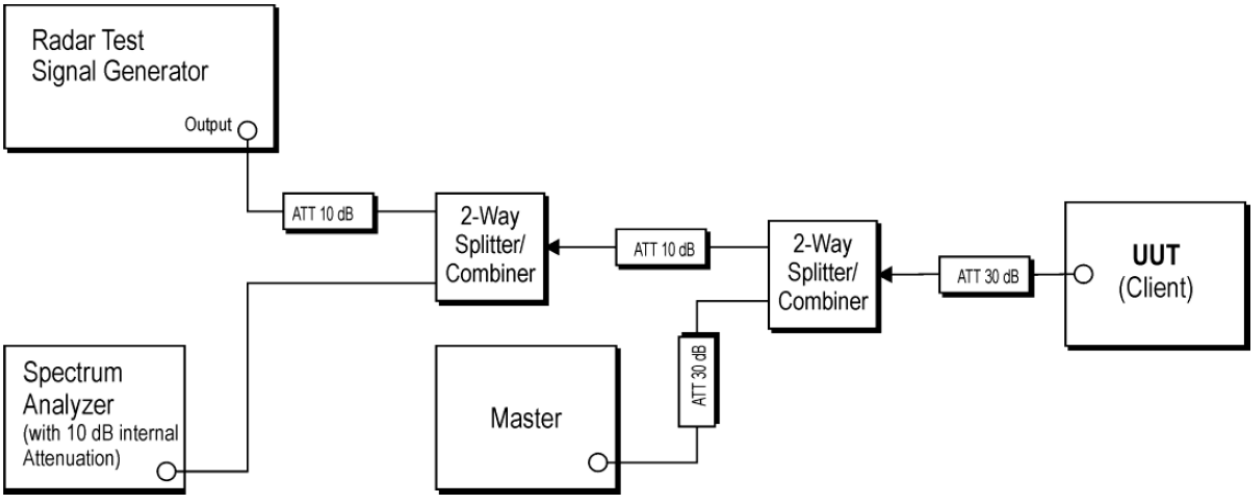
7.3 Setup for Client with injection at the Client



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8 Systems test configuration

Auxiliary Equipment Used during Test:

DESCRIPTION	MANUFACTURER	MODEL NO.(SHIELD)	S/N(LENGTH)
Notebook	Lenove	E470	PF-OU5TS7 17/09

Test software: adb.exe, which used to control the EUT in continues transmitting mode.

The pre-test has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates.

	Modulation Type	Data Rate	Index Value (Power level setting)
SISO	802.11a OFDM	6Mbps	17
	802.11n (HT20): OFDM	MCS0 (6.5Mbps)	16
	802.11ac (VHT20): OFDM	11ac 6.5Mbps	16
	802.11ac (VHT40): OFDM	11ac 13.5Mbps	14.5
	802.11ac (VHT80): OFDM	11ac 29.3Mbps	14

Device Capabilities
Duty Cycle: 100%
Note: 2.4GHz WLAN (DTS) operation is possible in 20MHz channel bandwidths.
5GHz WLAN (UNII) operation is possible in 20MHz, 40MHz and 80MHz channel bandwidths.

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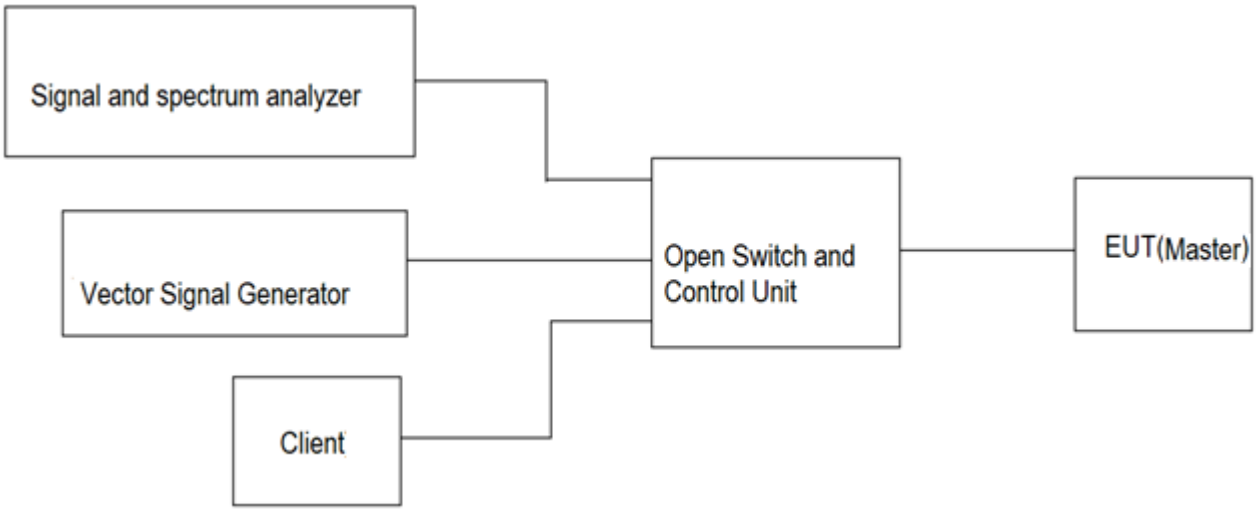
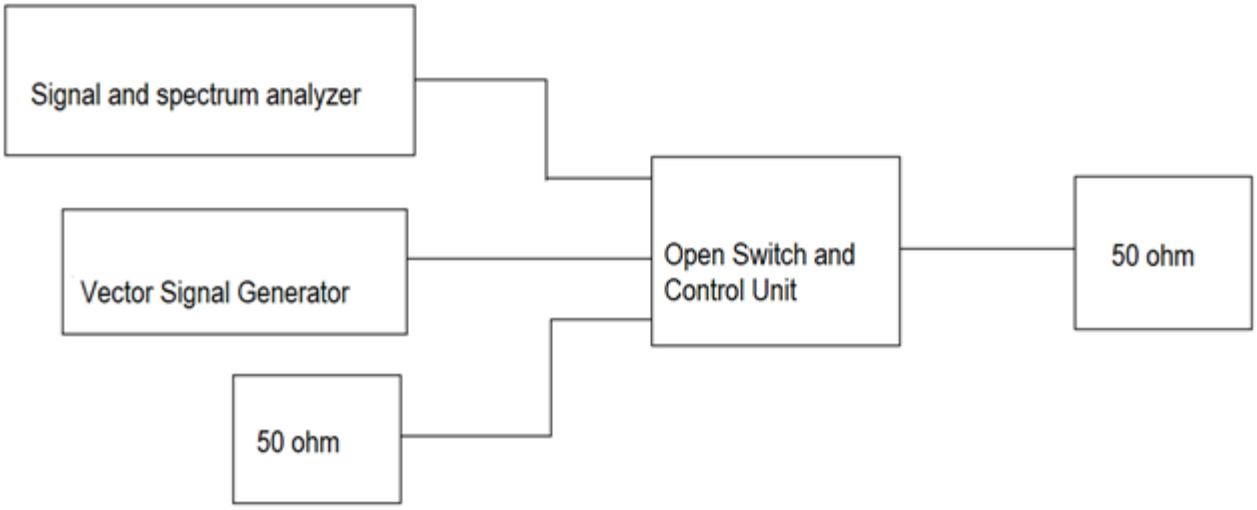
8.2 MWRF test system configuration

Conducted Test



Conducted Radar waveform calibration

(1) A 50ohm load is connected in place of the spectrum analyzer, and the spectrum analyzer is connected to place of the master.
(2) The interference Radar Detection Threshold Level is -62dBm+2.9dB+1.5dB=-57.6dBm that had been taken into account the output power range and antenna gain.
(3) The following equipment setup was used to calibrate the conducted radar waveform. A vector signal generator was utilized to establish the test signal level for radar type 0. During this process there were no transmissions by either the master or client device. The spectrum analyzer was switched to the zero spans (time domain) at the frequency of the radar waveform generator. Peak detection was used. The spectrum analyzer resolution bandwidth (RBW) and video bandwidth (VBW) were set to 3MHz. The spectrum analyzer had offset -1.5dB to compensate RF cable loss 1.5dB. And antenna cable is supplied with device, so antenna cable loss is 0.4dB.
(4) The vector signal generator amplitude was set so that the power level measured at the spectrum analyzer was -62dBm+2.9dB+1.5dB=-57.6dBm. Capture the spectrum analyzer plots on short pulse radar waveform.



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8.3 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.

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9 Dynamic Frequency Selection (DFS) Requirement

9.1 DFS Overview

The following table from KDB 905462 lists the applicable requirements for the DFS testing.

Table 1: Applicability of DFS Requirements Prior to Use of a Channel

Requirement	Operational Mode		
	Master	Client Without Radar Detection	Client With Radar Detection
Non-Occupancy Period	Yes	Not required	Yes
DFS Detection Threshold	Yes	Not required	Yes
Channel Availability Check Time	Yes	Not required	Not required
U-NII Detection Bandwidth	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
DFS Detection Threshold	Yes	Not required
Channel Closing Transmission Time	Yes	Yes
Channel Move Time	Yes	Yes
U-NII Detection Bandwidth	Yes	Not required

Additional requirements for devices with multiple bandwidth modes	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.		

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9.2 DFS Detection Thresholds

Table 3 below provides the *DFS Detection Thresholds* for *Master Devices* as well as *Client Devices* incorporating *In-Service Monitoring*

Table 3: DFS Detection Thresholds for Master Devices and Client Devices with Radar Detection

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. **Note3:** EIRP is based on the highest antenna gain. For MIMO devices refer to KDB Publication 662911 D01.	

9.3 Response Requirements

Table 4 provides the response requirements for *Master* and *Client Devices* incorporating DFS.

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.	

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9.5 RADAR TEST WAVEFORMS

This section provides the parameters for required test waveforms, minimum percentage of successful detections, and the minimum number of trials that must be used for determining DFS conformance. Step intervals of 0.1 microsecond for Pulse Width, 1 microsecond for PRI, 1 MHz for chirp width and 1 for the number of pulses will be utilized for the random determination of specific test waveforms.

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	See Note 1
1	1	Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in Table 5a	Roundup $\left\{\left(\frac{1}{360}\right)\cdot\left(\frac{19\cdot10^6}{PRI_{\mu sec}}\right)\right\}$	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
Note 1: Short Pulse Radar Type 0 should be used for the detection bandwidth test, channel move time, and channel closing time tests.					

A minimum of 30 unique waveforms are required for each of the Short Pulse Radar Types 2 through 4. If more than 30 waveforms are used for Short Pulse Radar Types 2 through 4, then each additional waveform must also be unique and not repeated from the previous waveforms. If more than 30 waveforms are used for Short Pulse Radar Type 1, then each additional waveform is generated with Test B and must also be unique and not repeated from the previous waveforms in Tests A or B.
For example if in Short Pulse Radar Type 1 Test B a PRI of 3066 µsec is selected, the number of pulses would be

$$\text{Roundup}\left\{\left(\frac{1}{360}\right)\cdot\left(\frac{19\cdot10^6}{3066}\right)\right\} = \text{Round up } \{17.2\} = 18.$$

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Table 5a - Pulse Repetition Intervals Values for Test A

Pulse Repetition Frequency Number	Pulse Repetition Frequency (Pulses Per Second)	Pulse Repetition Interval (Microseconds)
1	1930.5	518
2	1858.7	538
3	1792.1	558
4	1730.1	578
5	1672.2	598
6	1618.1	618
7	1567.4	638
8	1519.8	658
9	1474.9	678
10	1432.7	698
11	1392.8	718
12	1355	738
13	1319.3	758
14	1285.3	778
15	1253.1	798
16	1222.5	818
17	1193.3	838
18	1165.6	858
19	1139	878
20	1113.6	898
21	1089.3	918
22	1066.1	938
23	326.2	3066

The aggregate is the average of the percentage of successful detections of Short Pulse Radar Types 1-4. For example, the following table indicates how to compute the aggregate of percentage of successful detections.

Radar Type	Number of Trials	Number of Successful Detections	Minimum Percentage of Successful Detection
1	35	29	82.9%
2	30	18	60%
3	30	27	90%
4	50	44	88%
Aggregate (82.9% + 60% + 90% + 88%)/4 = 80.2%			

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Table 6 – Long Pulse Radar Test Waveform

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

The parameters for this waveform are randomly chosen. Thirty unique waveforms are required for the Long Pulse Radar Type waveforms. If more than 30 waveforms are used for the Long Pulse Radar Type waveforms, then each additional waveform must also be unique and not repeated from the previous waveforms.

Each waveform is defined as follows:
1) The transmission period for the Long Pulse Radar test signal is 12 seconds.
2) There are a total of 8 to 20 *Bursts* in the 12 second period, with the number of *Bursts* being randomly chosen. This number is *Burst Count*.
3) Each *Burst* consists of 1 to 3 pulses, with the number of pulses being randomly chosen. Each *Burst* within the 12 second sequence may have a different number of pulses.
4) The pulse width is between 50 and 100 microseconds, with the pulse width being randomly chosen. Each pulse within a *Burst* will have the same pulse width. Pulses in different *Bursts* may have different pulse widths.
5) Each pulse has a linear frequency modulated chirp between 5 and 20 MHz, with the chirp width being randomly chosen. Each pulse within a *transmission period* will have the same chirp width. The chirp is centered on the pulse. For example, with a radar frequency of 5300 MHz and a 20 MHz chirped signal, the chirp starts at 5290 MHz and ends at 5310 MHz.
6) If more than one pulse is present in a *Burst*, the time between the pulses will be between 1000 and 2000 microseconds, with the time being randomly chosen. If three pulses are present in a *Burst*, the random time interval between the first and second pulses is chosen independently of the random time interval between the second and third pulses.
7) The 12 second transmission period is divided into even intervals. The number of intervals is equal to *Burst Count*. Each interval is of length (12,000,000 / *Burst Count*) microseconds. Each interval contains one *Burst*. The start time for the *Burst*, relative to the beginning of the interval, is between 1 and [(12,000,000 / *Burst Count*) – (Total *Burst* Length) + (One Random PRI Interval)] microseconds, with the start time being randomly chosen. The step interval for the start time is 1 microsecond. The start time for each *Burst* is chosen randomly.

A representative example of a Long Pulse Radar Type waveform:
1) The total test waveform length is 12 seconds.
2) Eight (8) *Bursts* are randomly generated for the *Burst Count*.
3) *Burst* 1 has 2 randomly generated pulses.
4) The pulse width (for both pulses) is randomly selected to be 75 microseconds.
5) The PRI is randomly selected to be at 1213 microseconds.
6) *Bursts* 2 through 8 are generated using steps 3 – 5.
7) Each *Burst* is contained in even intervals of 1,500,000 microseconds. The starting location for Pulse 1, *Burst* 1 is randomly generated (1 to 1,500,000 minus the total *Burst* 1 length + 1 random PRI interval) at the 325,001 microsecond step. *Bursts* 2 through 8 randomly fall in successive 1,500,000 microsecond intervals (i.e. *Burst* 2 falls in the 1,500,001 – 3,000,000 microsecond range).

Table 7 – Frequency Hopping Radar Test Waveform

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

For the Frequency Hopping Radar Type, the same *Burst* parameters are used for each waveform. The hopping sequence is different for each waveform and a 100-length segment is selected from the hopping sequence defined by the following algorithm:
The first frequency in a hopping sequence is selected randomly from the group of 475 integer frequencies from 5250 – 5724 MHz. Next, the frequency that was just chosen is removed from the group and a frequency is randomly selected from the remaining 474 frequencies in the group. This process continues until all 475 frequencies are chosen for the set. For selection of a random frequency, the frequencies remaining within the group are always treated as equally likely.

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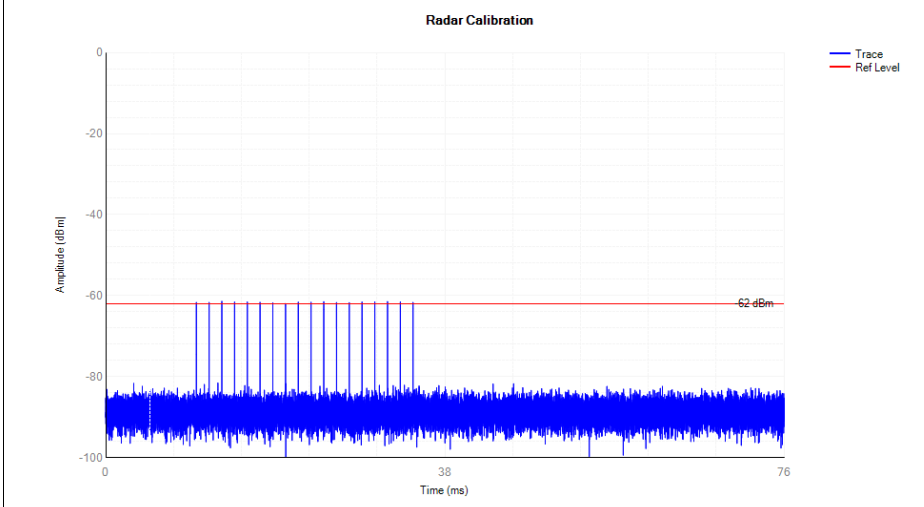
10 Test result

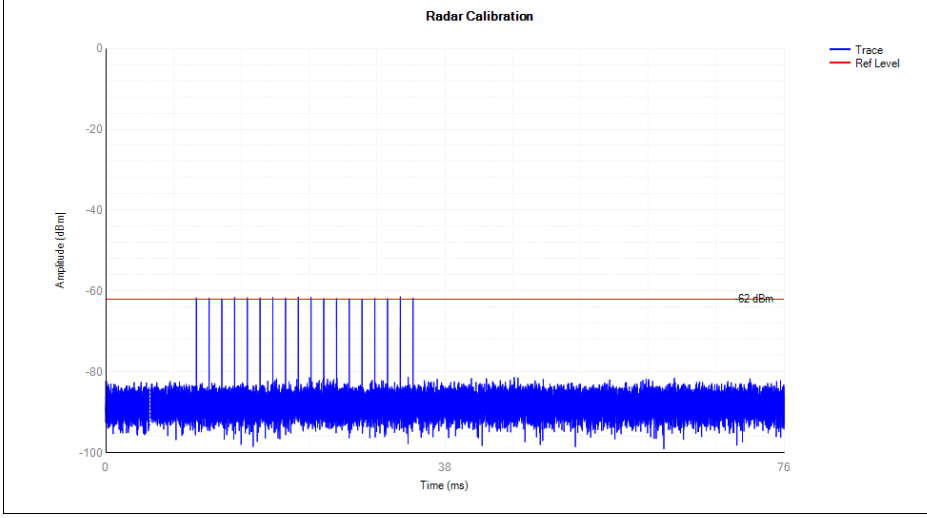
DFS Calibration

Test Graphs

5290MHz DFS_FCC_T0



5530MHz DFS_FCC_T0



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Shutdown Time

Mode	Frequency (MHz)	Channel Move Time (s)	Limit Channel Move Time (s)	Close Transmission Time (s)	Limit Close Transmission Time (s)	Close Transmission Time after 200ms(s)	Limit Close Transmission Time after 200ms (s)	Verdict
ac80	5290	0.5937	10	0.0426666666688	0.26	0.0040000000002	0.06	Pass
ac80	5530	0.570366667	10	0.0300000000015	0.26	0.0040000000002	0.06	Pass

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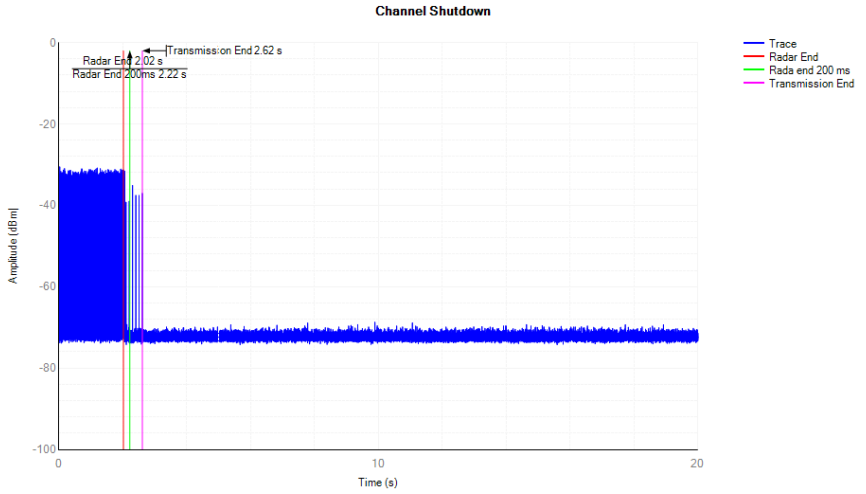
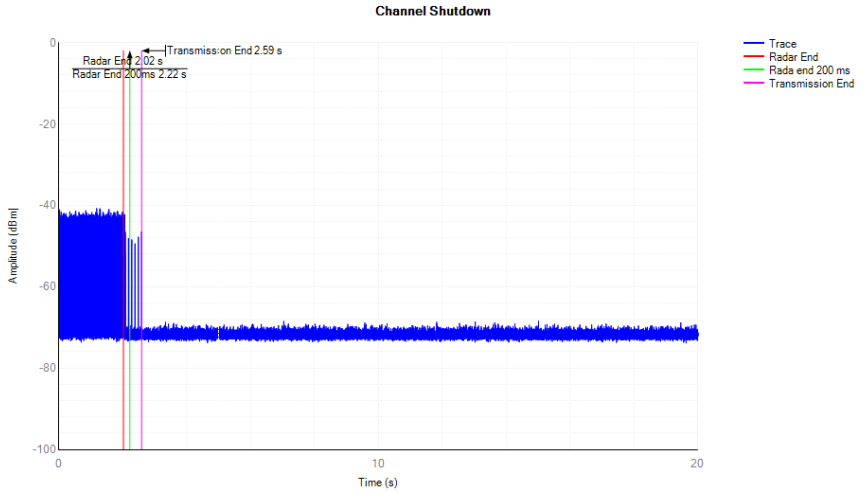
Test Graphs

ac80 5290MHz Shutdown



ac80 5530MHz Shutdown



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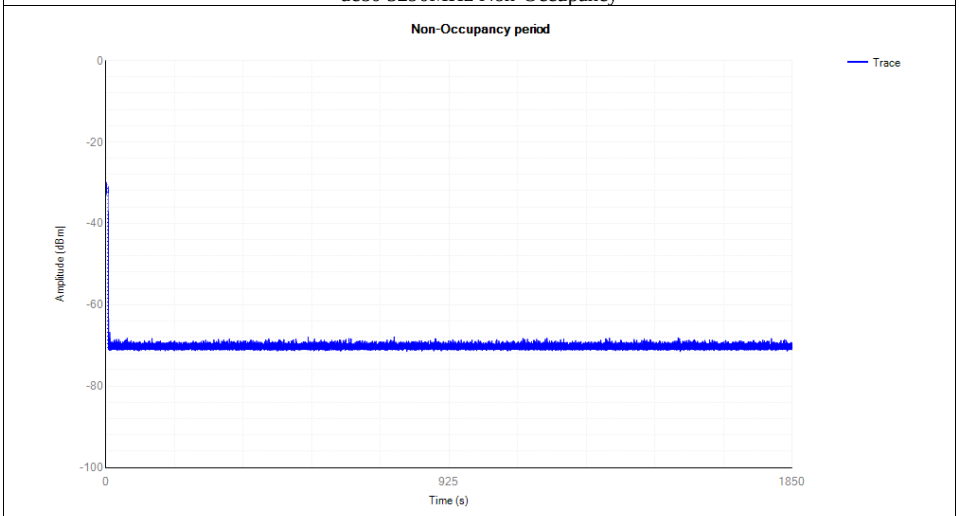
Non-Occupancy

During the 30 minutes observation time, UUT did not make any transmissions on a channel after a radar signal was detected on that channel by either the Channel Availability Check or the In-Service Monitoring.

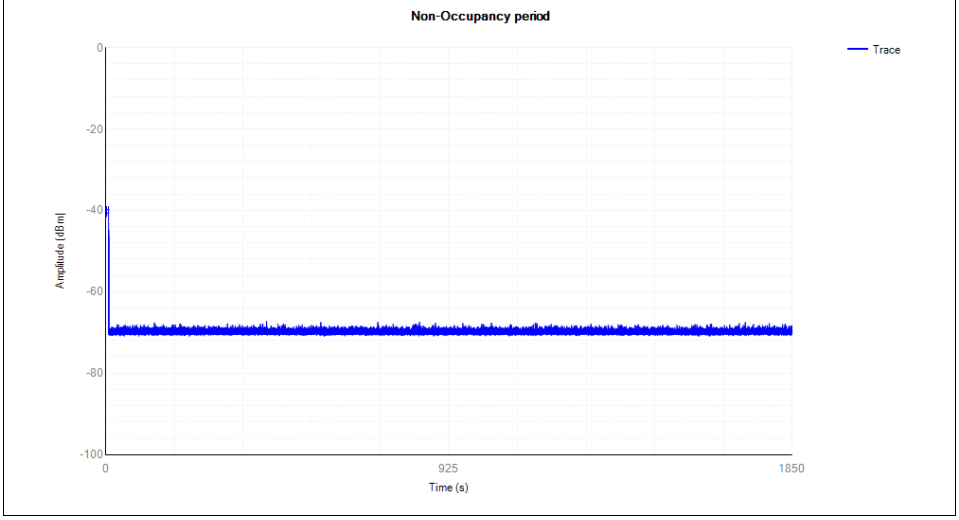
Mode	Frequency (MHz)	Result	Verdict
ac80	5290	See test Graph	Pass
ac80	5530	See test Graph	Pass

Test Graphs

ac80 5290MHz Non-Occupancy



ac80 5530MHz Non-Occupancy



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11 Test Equipment List

MWRF Test System

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DATE	CAL. DUE DATE
Vector signal generator	Agilent	N5182A	S2110417b-YQ-EMC	2023-11-10	2024-11-9
Signal spectrum analyzer	Agilent	N9020B	S2212433b-YQ-EMC	2024-2-19	2025-2-18
RF automatic control unit	MWRFtest	MW100-RFCB	S2110418b-YQ-EMC	2023-9-28	2024-9-27
Test software	MWRFtest	MTS 8310 V 3.0.0.0	N/A	N/A	N/A

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12 System Measurement Uncertainly

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

ITEMS	EXTENDED UNCERTAINTY
Conducted Disturbance at Mains Terminals	150kHz to 30MHz, LISN, 3.16dB
Radiated Disturbance	9kHz to 30MHz, 3.52dB 30MHz to 1GHz, 5.03dB (Horizontal) 5.12dB (Vertical) 1GHz to 18GHz, 5.49dB 18GHz to 40GHz, 5.63dB
RF Conducted Measurement	Power related： 1.16dB Frequency related： 6.00×10^{-8}

Measurement Uncertainty Decision Rule:

Determination of conformity with the specification limits is based on the decision rule according to IEC Guide 115: 2023, clause 4.3.3.

----------End of Test Report----------

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