TEST REPORT

CERTIFICATE OF CONFORMITY

Report No.:	RFBDGE-WTW-P24100076-4
FCC ID:	PU5-STV12R
Product:	POLY STUDIO V12 (Video Conference Equipment)
Brand:	hp, HP, HP Inc., poly
Model No.:	PATX-STV-12R
Received Date:	2024/8/12
Test Date:	2024/10/30 ~ 2024/11/4
Issued Date:	2024/12/4
Applicant:	Wistron Corporation
Address:	21F., No. 88, Sec. 1, HsinTai 5th Rd., Hsichi Dist, N/A, New Taipei City 221
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Lin Kou Laboratories
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan
Test Location:	No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, Taiwan
FCC Registration / Designation Number:	788550 / TW0003

Approved by: Jeremy Lin , **Date:** 2024/12/4

Jeremy Lin / Project Engineer

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Prepared by : Lena Wang / Specialist

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Release Control Record

Issue No.	Description	Date Issued
RFBDGE-WTW-P24100076-4	Original release.	2024/12/4

1 Certificate

Product:	POLY STUDIO V12 (Video Conference Equipment)
Brand:	hp, HP, HP Inc.,
Test Model:	PATX-STV-12R
Sample Status:	Engineering sample
Applicant:	Wistron Corporation
Test Date:	2024/10/30 ~ 2024/11/4
Measurement procedure:	KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (Section 15.407)			
Clause	Test Item	Result	Remark
15.407(h)	U-NII Detection Bandwidth	N/A	Not Applicable
15.407(h)	Channel Availability Check Time	N/A	Not Applicable
15.407(h)	Channel Closing Transmission and Channel Move Time	Pass	Applicable
15.407(h)	Non-Occupancy Period	N/A	Not Applicable
15.407(h)	Statistical Performance Check	N/A	Not Applicable
15.407(h)	Non-Associated Test	Pass	Applicable
15.407(h)	Non Co-Channel Test	Pass	Applicable

Note: Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.1 Supplementary Information

There is not any deviation from the test standards for the test method, and no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	POLY STUDIO V12 (Video Conference Equipment)
Brand	hp, HP, HP Inc., poly
Test Model	PATX-STV-12R
DFS Firmware/software version	Android 13 Kernel version 5.15.94-android 13-8-rockstars/main-mtk/eat-bid-13946 #1 Tue Aug 6 21:09:25 UTC 2024
Operational Mode	Client without radar detection (without TPC function)
Operating Frequency Band	5.25 GHz ~ 5.35 GHz 5.47 GHz ~ 5.725 GHz

Note:

1. The EUT uses following accessories.

Item	Brand	Model	Part Number	Specification
AC Adapter (Support unit)	HP	TPN-DA20	L6550-003	AC Input : 100-240V~1.7A 50-60Hz DC Output : 5.0V=3.0A,15.0W or 9.0V=3.0A or 12.0V=5.0A or 15.0V=4.33A or 20.0V=3.25A,65.0W DC Output Cable : 1.75M / without core power cord : 1.75M BSMI ID : R33030 Manufacturer : Delta Electronics, Inc.
RJ-45 cable	-	-	-	Signal Line : 2M
Type C cable	-	-	-	Signal Line : 2M

2. The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.

3.2 Antenna Description of EUT

1. The antenna information is listed as below.

Antenna Type	PCB				
Antenna Connector	i-pex(MHF)				
Antenna No.	Gain (dBi)				
	2.4~2.4835GHz	5.15~5.25GHz	5.25~5.35GHz	5.47~5.725GHz	5.725~5.85GHz
Main	2.84	4.42	4.39	4.8	4.8
Aux	2.62	4.78	4.78	4.79	4.79
*For BT: during testing to set aux antenna. *For WLAN 2.4G and 5G: during testing to set main antenna.					

*Detail antenna specification please refer to antenna datasheet and/or antenna measurement report.

*BT and WLAN does not support diversity function.

3.3 EUT Power Level

Highest power level						
Signal Mode	Frequency Band (MHz)	Conducted Power		Gain (dBi)	EIRP	
		(mW)	(dBm)		(mW)	(dBm)
CDD	5250-5350	29.444	14.69	4.39	80.910	19.08
	5470-5725	30.549	14.85	4.8	92.257	19.65

4 Test Instruments

The calibration interval of the all test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.1 Channel Closing Transmission and Channel Move Time

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
EMI Test Receiver R&S	ESR7	101451	2024/4/1	2025/3/31
Horn Antenna Schwarzbeck	BBHA 9120D	9120D-563	2023/11/12	2024/11/11
MXG Vector signal generator Keysight	N5182B	MY53052282	2024/1/8	2025/1/7

Notes:

1. The test was performed in DFS room.
2. Tested Date: 2024/10/30 ~ 2024/11/4

4.2 Non-Associated Test

Refer to section 4.1 to get the tested date and information of the instruments.

5 Limits of Test Items

5.1 Working Modes and Required Test Items

The manufacturer shall state whether the UUT is capable of operating as a Master and/or a Client. If the UUT is capable of operating in more than one operating mode then each operating mode shall be tested separately. See tables 1 and 2 for the applicability of DFS requirements for each of the operational modes.

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

Requirement	Operational Mode		
	Master	Client without radar detection	Client with radar detection
Non-Occupancy Period	✓	✓ note	✓
DFS Detection Threshold	✓	Not required	✓
Channel Availability Check Time	✓	Not required	Not required
U-NII Detection Bandwidth	✓	Not required	✓
Note: Per KDB 905462 D03 UNII Clients Without Radar Detection New Rules v01r02 section (b)(5/6), If the client moves with the master, the device is considered compliant if nothing appears in the client non-occupancy period test. For devices that shut down (rather than moving channels), no beacons should appear. An analyzer plot that contains a single 30-minute sweep on the original channel.			

Table 2: Applicability of DFS Requirements during Normal Operation.

Requirement	Operational Mode	
	Master or Client with radar detection	Client without radar detection
DFS Detection Threshold	✓	Not required
Channel Closing Transmission Time	✓	✓
Channel Move Time	✓	✓
U-NII Detection Bandwidth	✓	Not required

Additional requirements for devices with multiple bandwidth modes	Master 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.		

5.2 Test Limits and Radar Signal Parameters

Detection Threshold Values

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. 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.	

Parameters of DFS Test Waveforms

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 --- Test B: 15 unique PRI values randomly selected within the range of 518-3066 μ sec, with a minimum increment of 1 μ sec, excluding PRI values selected in Test A	$\text{Roundup}\left\{\left(\frac{1}{360}\right)\cdot\left(\frac{19\cdot 10^6}{\text{PRI}_{\mu\text{sec}}}\right)\right\}$	60%	30
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.					

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

Three subsets of trials will be performed with a minimum of ten trials per subset. The subset of trials differ in where the Long Pulse Type 5 Signal is tuned in frequency.

a) the Channel center frequency
b) tuned frequencies such that 90% of the Long Pulse Type 5 frequency modulation is within the low edge of the UUT Occupied Bandwidth
c) tuned frequencies such that 90% of the Long Pulse Type 5 frequency modulation is within the high edge of the UUT Occupied Bandwidth

It include 10 trails for every subset, the formula as below,

For subset case 1: the center frequency of the signal generator will remain fixed at the center of the UUT Channel.

For subset case 2: to retain 90% frequency overlap between the radar signal and the UUT Occupied Bandwidth, the center frequency of the signal generator will vary for each of the ten trials in subset case 2. The center frequency of the signal generator for each trial is calculated by:

$FL+(0.4*Chirp\ Width\ [in\ MHz])$

For subset case 3: to retain 90% frequency overlap between the radar signal and the UUT Occupied Bandwidth, the center frequency of the signal generator will vary for each of the ten trials in subset case 3. The center frequency of the signal generator for each trial is calculated by:

$FH-(0.4*Chirp\ Width\ [in\ MHz])$

Table 7: Frequency Hopping Radar Test Waveform

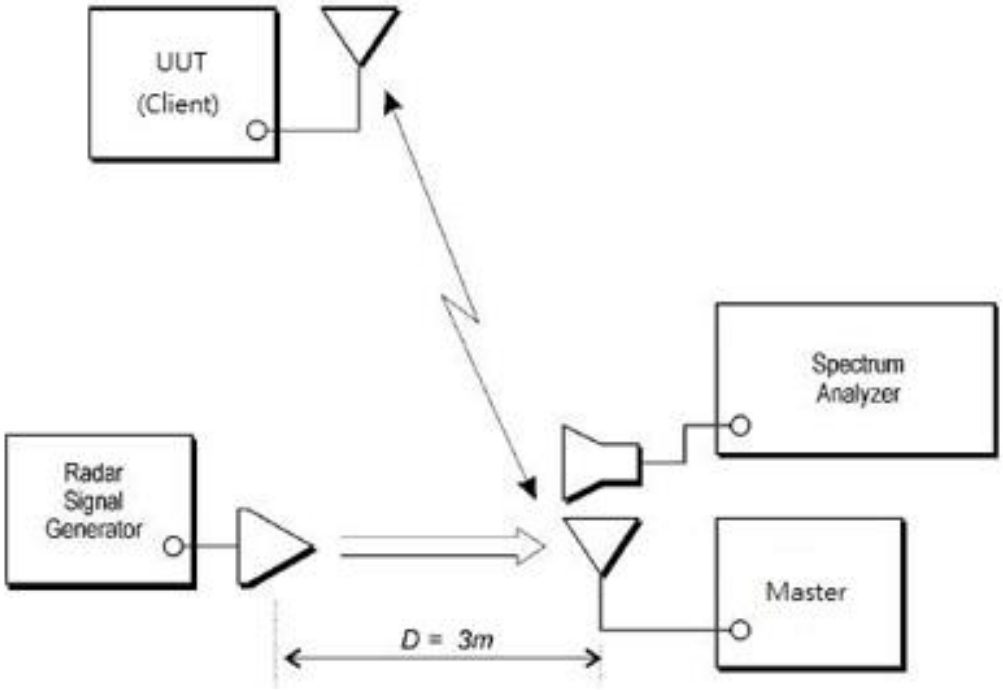
Radar Type	Pulse Width (μsec)	PRI (μsec)	Pulses per Hop	Hopping Rate (kHz)	Hopping Sequence Length (msec)	Minimum Percentage of Successful Detection	Minimum Number of Trials
6	1	333	9	0.333	300	70%	30

6 Test Arrangements

6.1 Test Setup

Radiated measurement

Client without Radar Detection Mode



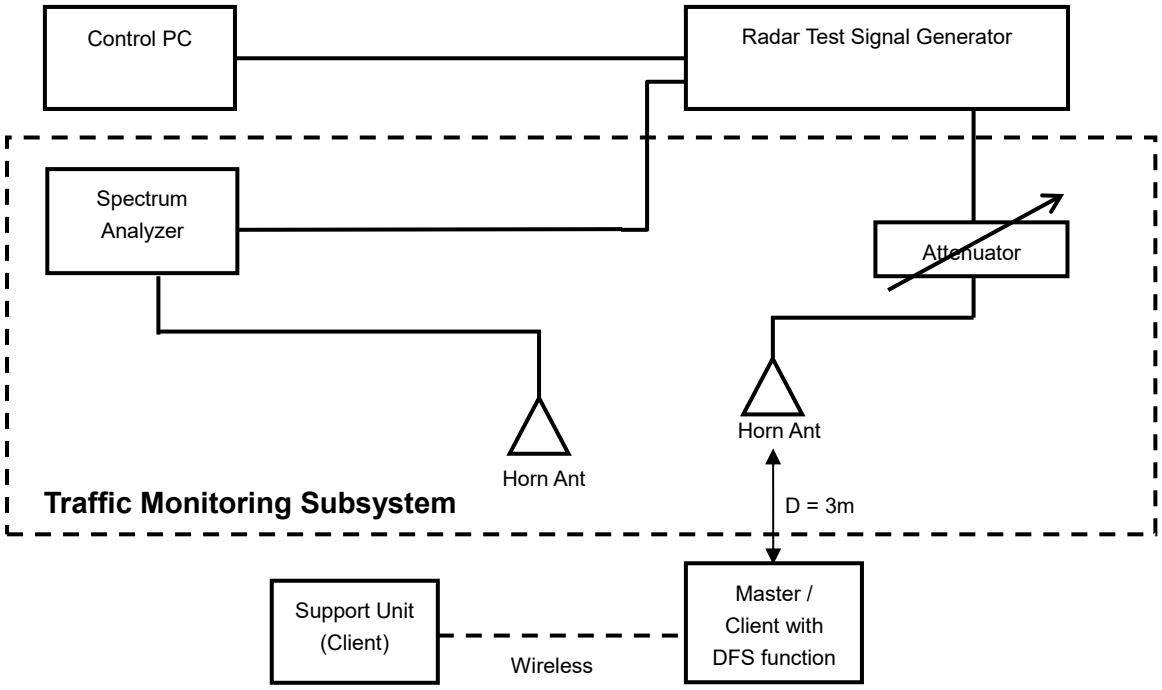
The UUT is a U-NII Device operating in Client mode without radar detection. The radar test signals are injected into the Master Device.Applicable Evaluation Criteria

6.2 Test Procedure

6.2.1 DFS Measurement System

A complete DFS Measurement System consists of two subsystems: (1) the Radar Signal Generating system and (2) the Traffic Monitoring system. The control PC is necessary for generating the Radar waveforms in Table 5, 6 and 7. The traffic monitoring subsystem is specified to the type of unit under test (UUT).

Radiated Setup Configuration of DFS Measurement System



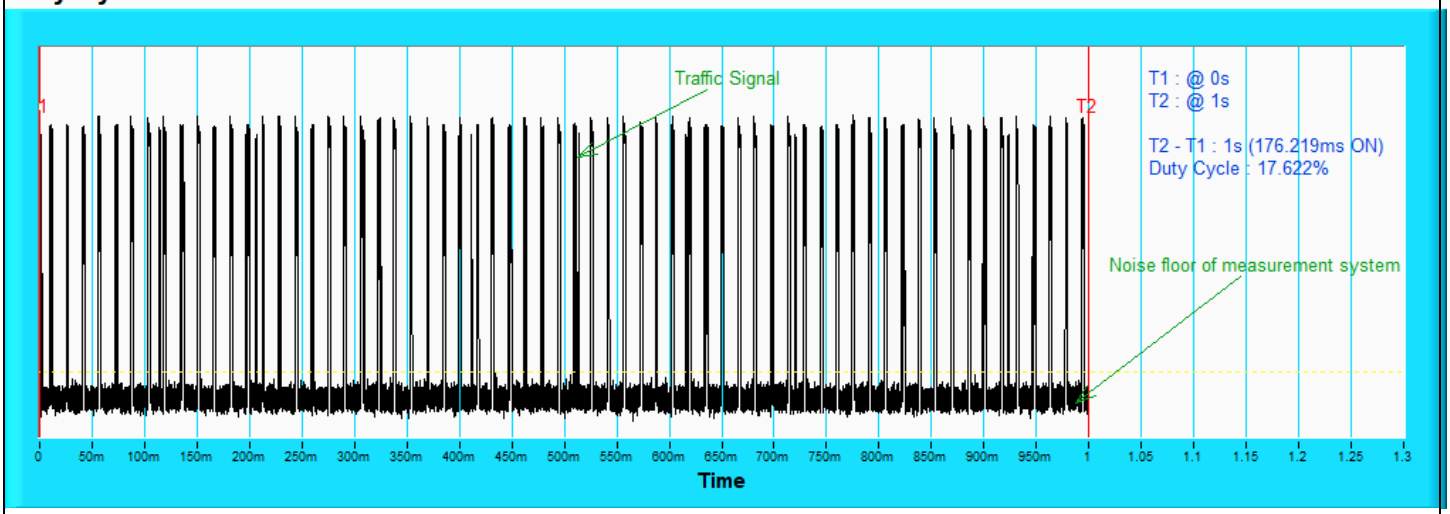
Channel Loading

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:

Applicable	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.
	d) Unicast or Multicast protocols are preferable but other protocols may be used. The appropriate protocol used must be described in the test procedures.

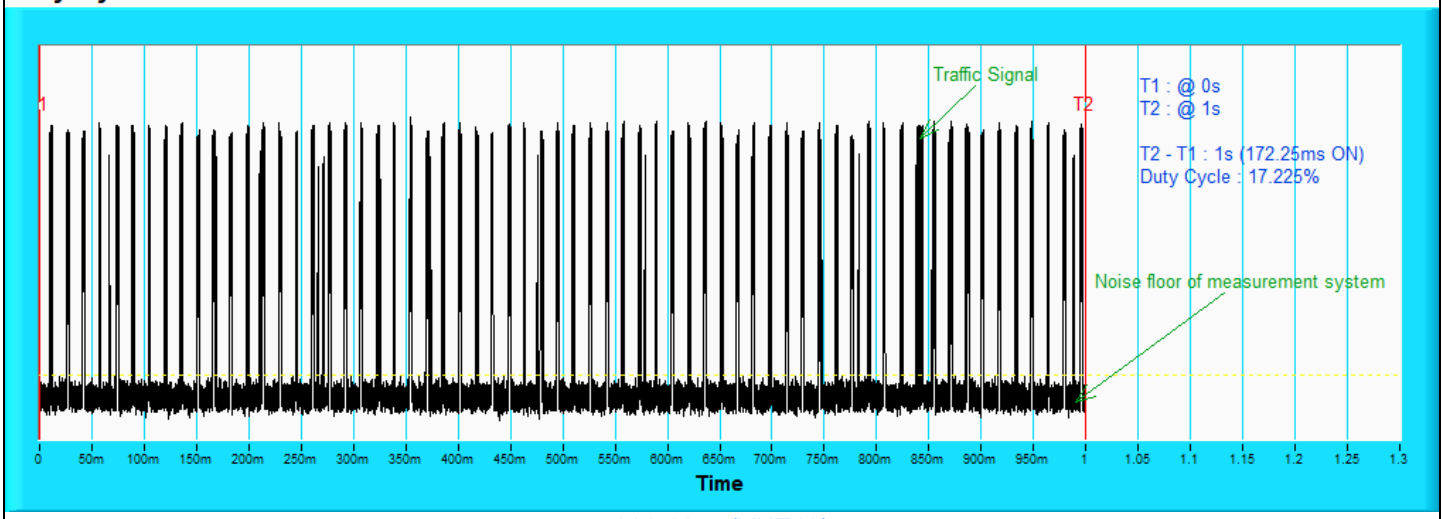
Plots of Channel Loading

Duty Cycle



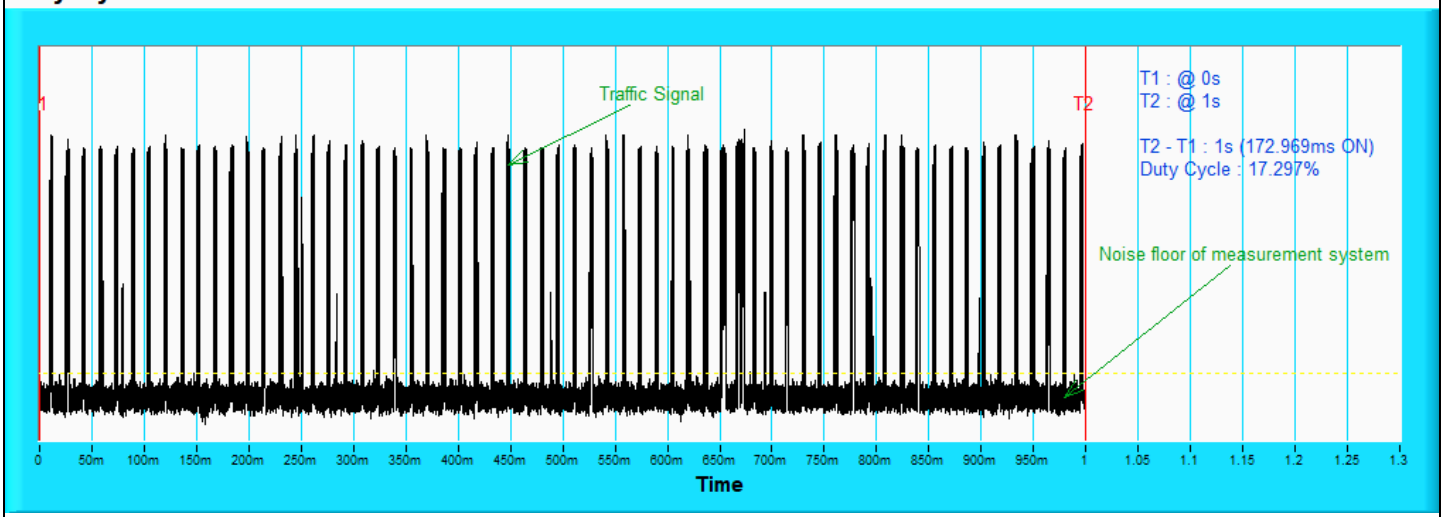
802.11ac (VHT20)

Duty Cycle



802.11ac (VHT40)

Duty Cycle



802.11ac (VHT80)

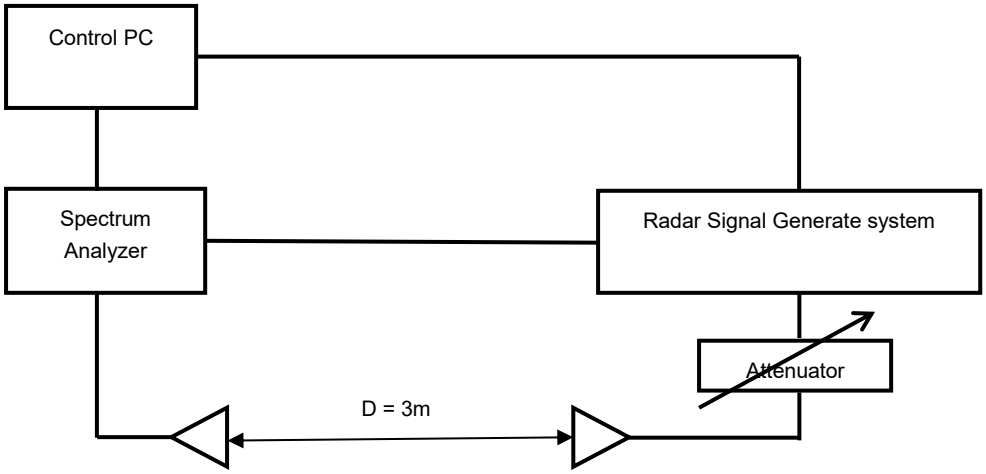
6.2.2 Calibration of DFS Detection Threshold Level

The measured channel is chosen from the operating channels of the UUT within the DFS band and using the all bandwidth mode available for the link. The radar signal was the same as transmitted channels, and injected into the antenna of AP (master) or Client Device with Radar Detection, measured the channel closing transmission time and channel move time.

Radiated setup configuration of Calibration of DFS Detection Threshold Level

The radar signal generate system is gererating waveform pattern of radar types. The amplitude of the radar signal generator system is adjusted to yield a level of -64 dBm as measured on the spectrum analyzer.

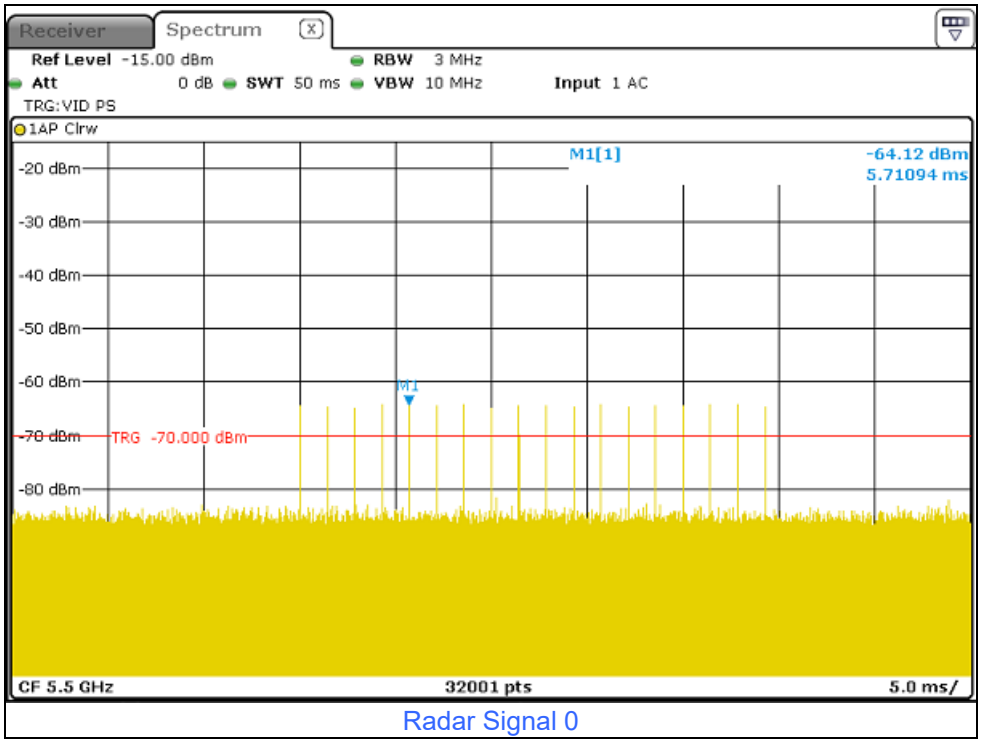
The interference detection threshold level is lower than -64 dBm hence it provides margin to the limit.



6.2.3 DFS Detection Threshold

Test Mode: Device Operating in Client without radar detection Mode
Client with injection at the Master. (The radar test waveforms are injected into the Master Device)

For detection threshold level of -64 dBm, the tested level is lower than required level for 1 dB, hence it provides margin to the limit.



Radar Signal 0

6.2.4 DFS Companion Device

Companion Device Information					
Product	**Brand**	**Model No.**	**FCC ID**	**Specification**	**Software/Firmware Version**
802.11ax wireless Router	ASUS	RT-AX88U	MSQ-RTAXHP00	5G Ant Min gain : 2.24dB Maximum EIRP : 26.30dBm	3.0.0.4.384_6210-g8fa97e7

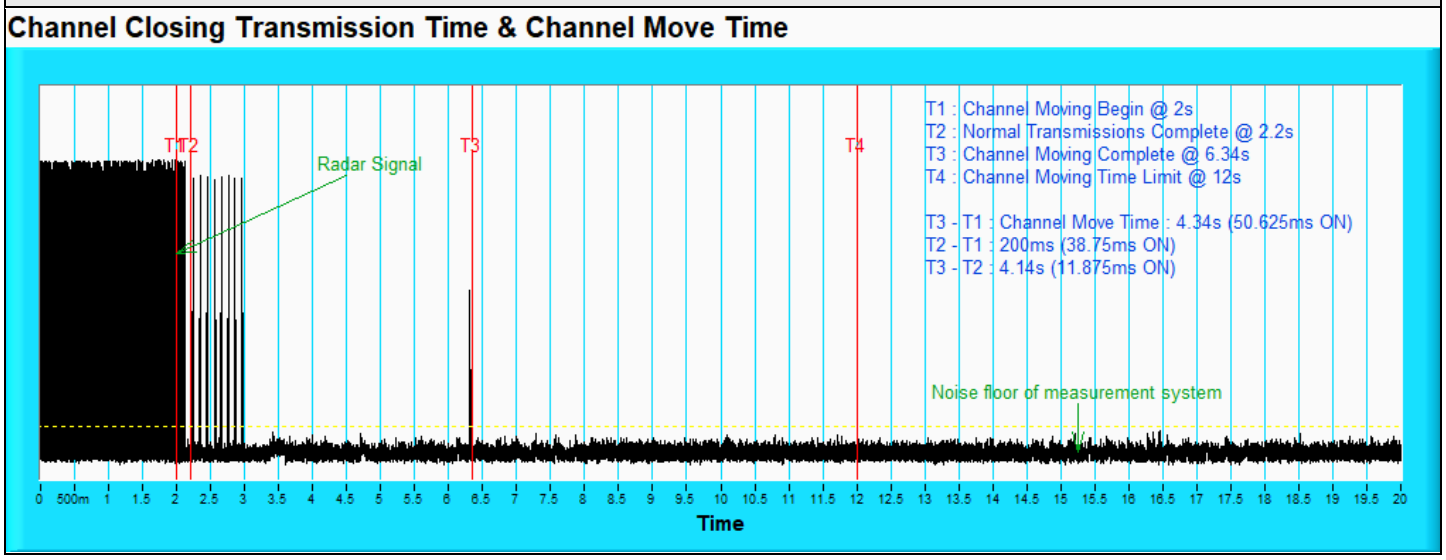
Note: This device was functioned as a Master device during the DFS test.

7 Test Results of Test Item

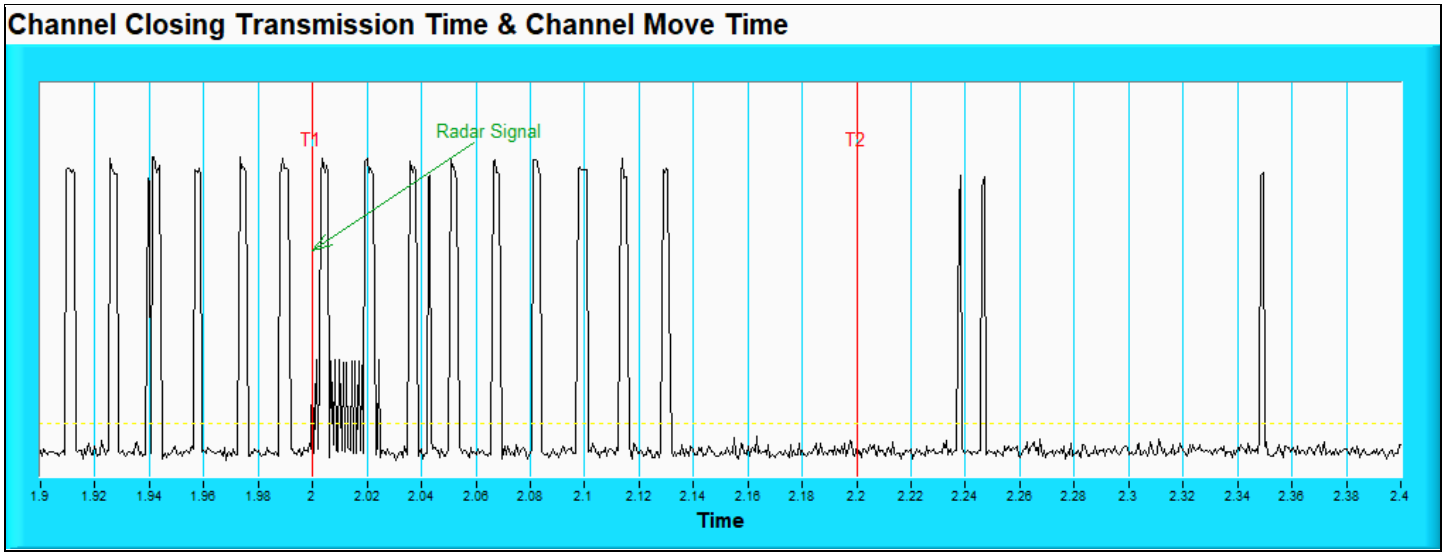
7.1 Channel Closing Transmission and Channel Move Time

Environmental Conditions:	25°C, 60% RH	Tested By:	Chun Wu

BW20 Radar signal 0

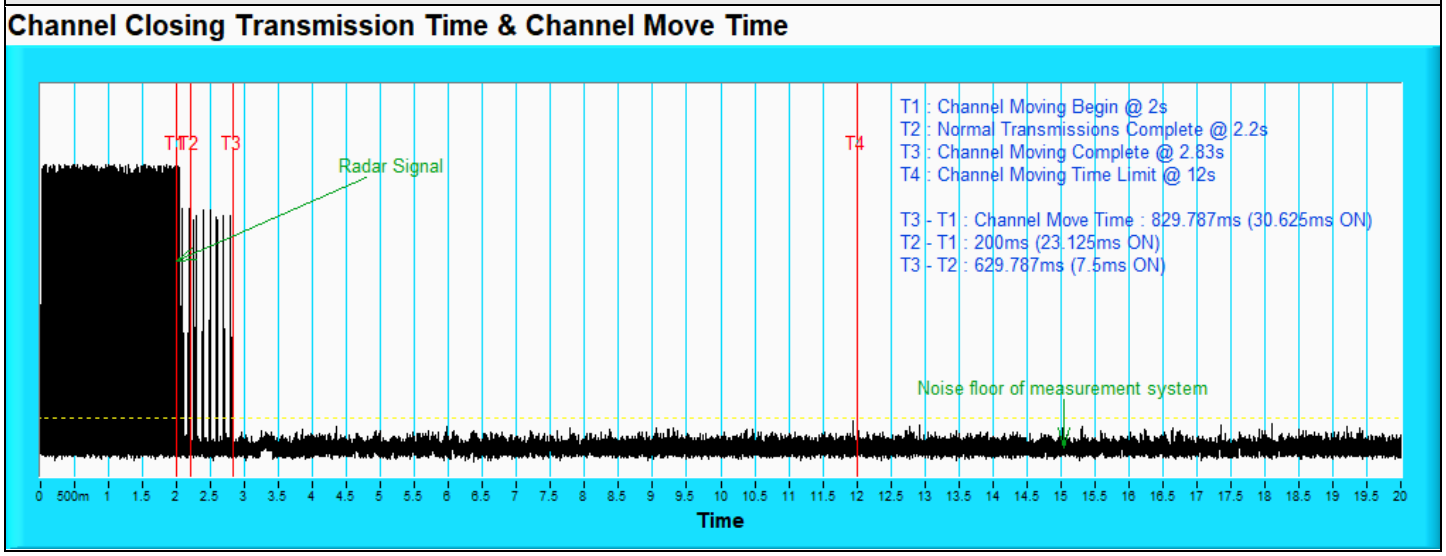


Note: T1 denotes the start of Channel Move Time upon the end of the last Radar burst. T2 denotes the data transmission time of 200 ms from T1. T3 denotes the end of Channel Move Time. T4 denotes the 10 second from T1 to observe the aggregate duration of transmissions.

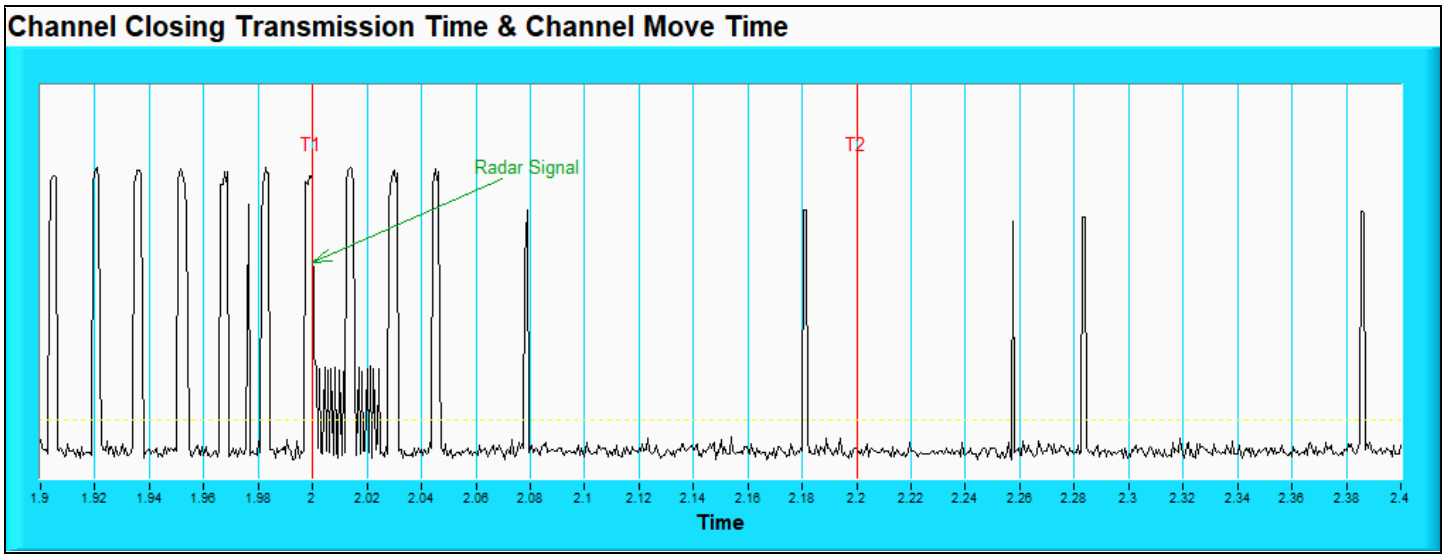


Note: Zoom in of the first 500 ms after radar signal applied.

BW40 Radar signal 0

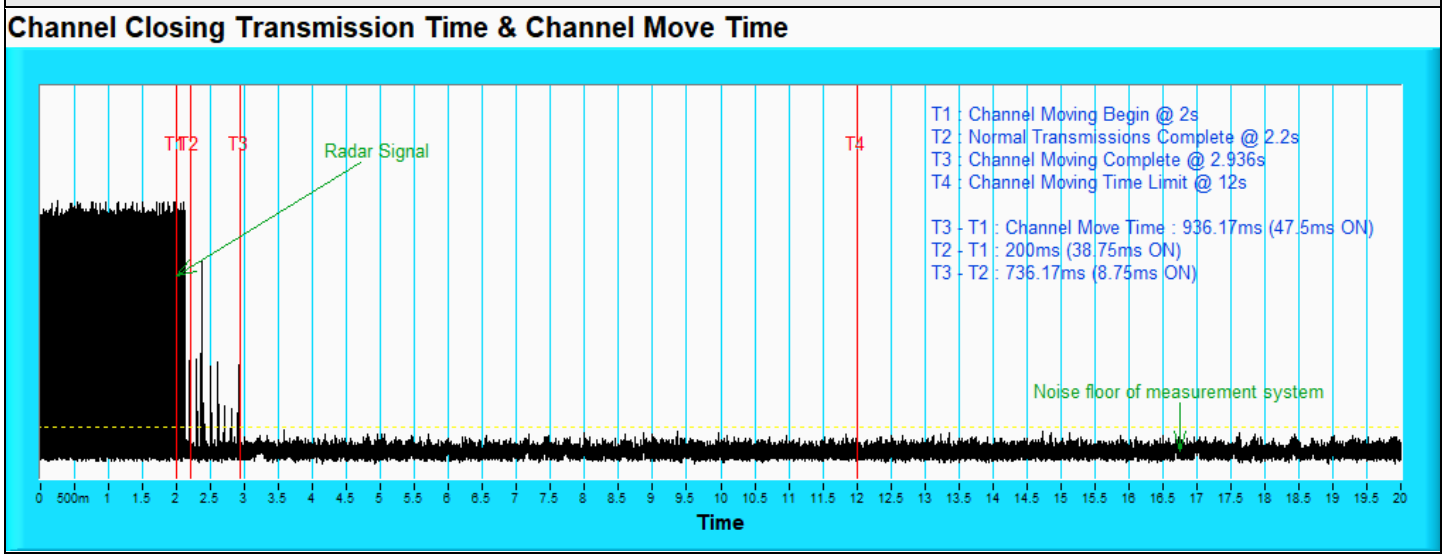


Note: T1 denotes the start of Channel Move Time upon the end of the last Radar burst. T2 denotes the data transmission time of 200 ms from T1. T3 denotes the end of Channel Move Time. T4 denotes the 10 second from T1 to observe the aggregate duration of transmissions.

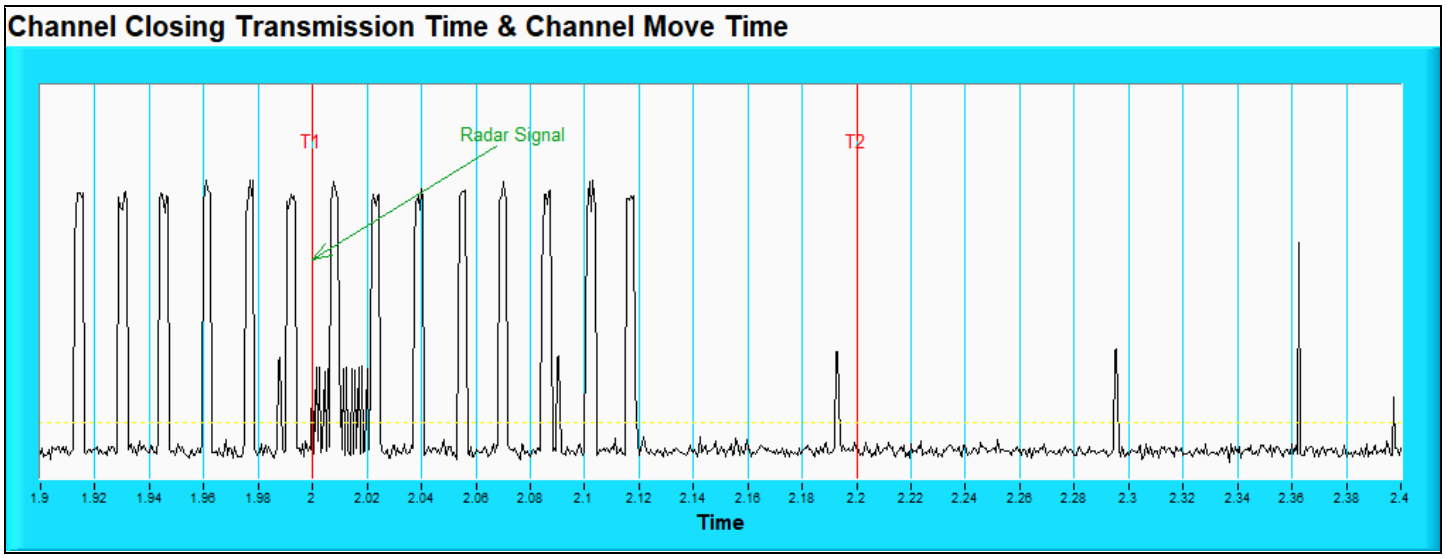


Note: Zoom in of the first 500 ms after radar signal applied.

BW80 Radar signal 0



Note: T1 denotes the start of Channel Move Time upon the end of the last Radar burst. T2 denotes the data transmission time of 200 ms from T1. T3 denotes the end of Channel Move Time. T4 denotes the 10 second from T1 to observe the aggregate duration of transmissions.

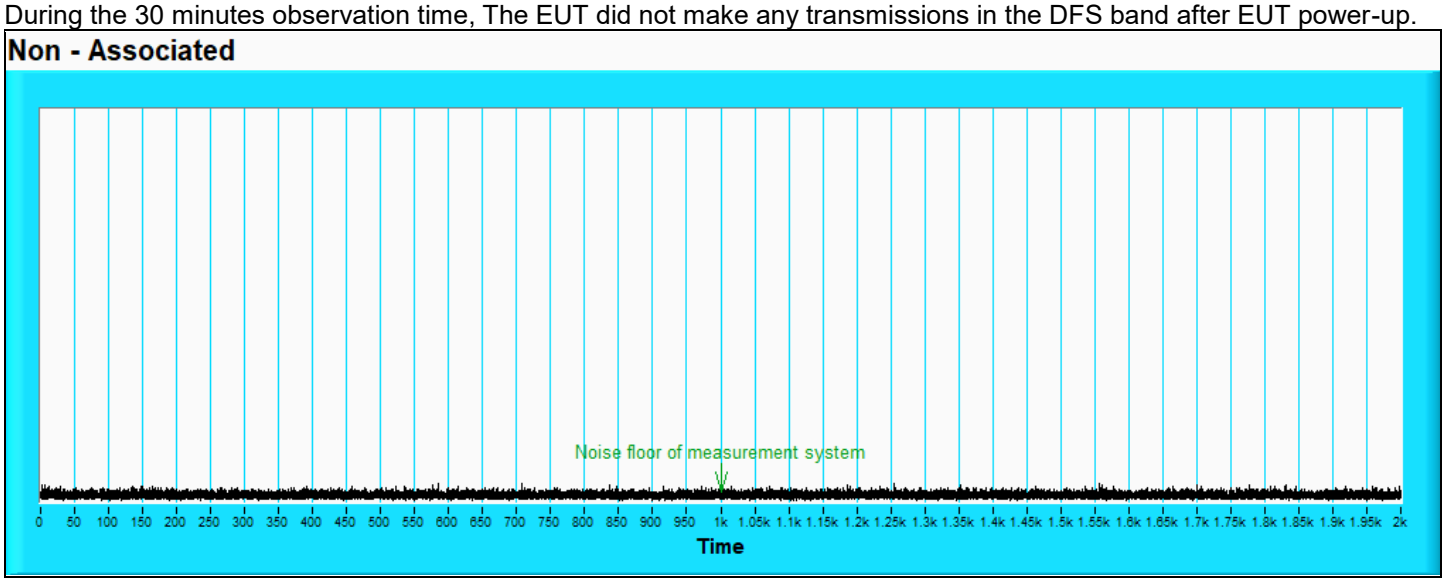


Note: Zoom in of the first 500 ms after radar signal applied.

7.2 Non-Associated Test

Environmental Conditions:	25°C, 60% RH	Tested By:	Chun Wu

Master was off.
During the 30 minutes observation time, The EUT did not make any transmissions in the DFS band after EUT power-up.



8 Description of the Manufacturer U-NII device

8.1 Non Co-Channel

For client mode

The UUT was investigated after radar was detected and confirmed that no co-channel operation with radars.

8.2 Uniform Spreading

The intention of the uniform spreading is to provide, on aggregate, a uniform loading of the spectrum. The UUT randomly select next output channel without any bias or fixed pattern, so that all channels in DFS Bands (5.25 to 5.35 GHz and 5.47 to 5.725 GHz) will be used equally.

8.3 Transmit Power Control (TPC)

U-NII devices operating in DFS Bands (5.25 to 5.35 GHz and 5.47 to 5.725 GHz) shall employ a TPC mechanism. The U-NII device is required to have the capability to operate at least 6 dB below the mean EIRP value of 30 dBm. A TPC mechanism is not required for systems with an e.i.r.p. of less than 500 mW.

Maximum e.i.r.p. of this device is 92.257 mW which is less than 500 mW, therefore it's not required TPC function.

Applicable	e.i.r.p.	FCC 15.407 (h)(1)
	>500 mW	The TPC mechanism is required for system with an e.i.r.p. of above 500 mW
√	<500 mW	The TPC mechanism is not required for system with an e.i.r.p. of less 500 mW

The UUT can adjust a transmitter's output power based on the signal level present at the receiver. TPC is auto controlled by software.

8.4 Statement of Maunfacturer

Manufacturer statement confirming that information regarding the parameters of the detected Radar Waveforms is not available to the end user. And the device doesn't have ad-hoc mode on DFS frequency band.

9 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo)

10 Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

Lin Kou EMC/RF Lab
Tel: 886-2-26052180
Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab
Tel: 886-3-6668565
Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety Lab
Tel: 886-3-3183232
Fax: 886-3-3270892

Email: service.adt@bureauveritas.com
Web Site: http://ee.bureauveritas.com.tw

The address and road map of all our labs can be found in our web site also.

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