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MEASUREMENT REPORT FCC PART 15.407 / ISED RSS-247 DFS

Applicant Name: Apple Inc. One Apple Park Way Cupertino, CA 95014 United States	Date of Testing: 12/10/2019 - 02/03/2020 Test Site/Location: PCTEST. Morgan Hill, CA, USA Test Report Serial No.: 1C1912170050-07.BCG		
FCC ID:	BCGA2228		
IC:	579C-A2228		
APPLICANT:	Apple Inc.		
Application Type: Mode/HVIN: EUT Type: Max. RF Output Power:	Certification A2228 Client Only Device, No Radar Detection Capability 88.512 mW (19.47 dBm) Conducted		
Frequency Range:	(802.11n UNII Band 2A) 80.168 mW (19.04 dBm) Conducted (802.11n UNII Band 2C) 5250 – 5350 MHz (UNII-2A Band)		
FCC Classification: FCC Rule Part(s): ISED Specification:	5470 – 5725 MHz (UNII-2C Band) Unlicensed National Information Infrastructure (UNII) Part 15 Subpart E (15.407) RSS-247 Issue 2		

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in KDB 905462 D02 v02 Compliance Measurement Procedures for Unlicensed-National Information Infrastructure Devices Operating in the 5.25 – 5.35 GHz and 5.47 – 5.725 GHz Bands Incorporating Dynamic Frequency Selection. Test results reported herein relate only to the item(s) tested.

KDB 905462 D02 v02

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the gualifications of all persons taking them.



Randy Ortanez President

Test Procedure(s):

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1.0 INTRODUCTION

1.1 Scope

This report has been prepared to demonstrate compliance with the requirements for Dynamic Frequency Selection (DFS) as stated in KDB 905462 D02 v02. As of July 20, 2007, all devices operating in the 5250 – 5350 MHz and/or the 5470 – 5725 MHz bands (excluding 5600-5650MHz for ISED Canada) must comply with the DFS requirements.

1.2 PCTEST Test Location

These measurement tests were conducted at the PCTEST facility located at 18855 Adams Court, Morgan Hill, CA 95037. The measurement facility is compliant with the test site requirements specified in ANSI C63.4-2014 and KDB 414788 D01 v01r01.

1.3 Test Facility / Accreditations

Measurements were performed at PCTEST located in Morgan Hill, CA 95037, U.S.A.

- PCTEST is an ISO 17025-2005 accredited test facility under the American Association for Laboratory Accreditation (A2LA) with Certificate number 2041.02 for Specific Absorption Rate (SAR), Hearing Aid Compatibility (HAC) testing, where applicable, and Electromagnetic Compatibility (EMC) testing for FCC and Innovation, Science, and Economic Development Canada rules.
- PCTEST TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC 17065-2012 by A2LA (Certificate number 2041.03) in all scopes of FCC Rules and ISED Standards (RSS).
- PCTEST facility is a registered (22831) test laboratory with the site description on file with ISED.

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2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Apple Tablet Device FCC ID: BCGA2228**. The test data contained in this report pertains only to the emissions due to the EUT's UNII transmitter. As the EUT does not have radar detection capability it was evaluated as a Client Only Device. All test results reported herein are applicable to the sample selected for testing.

Mode of Operation:

Master Device	
Client Device (No radar detection)	\boxtimes
Client Device with Radar Detection	

Test Device Serial No.: DLXZR004P7FK

2.2 Device Capabilities

This device contains the following capabilities:

802.11b/g/n/ax WLAN, 802.11a/n/ac/ax UNII, Bluetooth (1x, EDR, LE, HDR4, HDR8)

This device supports BT Beamforming

	Band 1		Band 2A		Band 2C		Band 3
Ch.	Frequency (MHz)						
36	5180	52	5260	100	5500	149	5745
:	:	:	:	:	:	:	:
42	5210	56	5280	116	5580	157	5785
:	:	:	:	:	:	:	:
48	5240	64	5320	144	5720	165	5825

Table 2-1. 802.11a / 802.11n / 802.11ac (20MHz) Frequency / Channel Operations

	Band 1		Band 2A		Band 2C		Band 3
Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)
38	5190	54	5270	102	5510	151	5755
:	:	:	:	:	:	:	:
46	5230	62	5310	110	5550	159	5795
		<u> </u>		:	:		
				142	5710		

Table 2-2. 802.11n / 802.11ac (40MHz BW) Frequency / Channel Operations

	Band 1	Band 2A		Band 2C			Band 3			
Ch.	Frequency (MHz)	•	Ch.	Frequency (MHz)		Ch.	Frequency (MHz)		Ch.	Frequency (MHz)
42	5210		58	5290		106	5530		155	5775
						:	:			
						138	5690			

Table 2-3. 802.11ac (80MHz BW) Frequency / Channel Operations

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2.3 Antenna Description

Following antenna was used for the testing.

		Antenna Gain (dBi)				
	Frequency [GHz]	5GHz ANTUpper	5GHz ANTLower			
	5.150 – 5.250	2.1	-0.2			
	5.260 - 5.350	1.3	0.2			
	5.470 – 5.725	3.7	2.3			
ĺ	5.745 – 5.850	4.7	2.8			

Table 2-4. Highest Antenna Gain

2.4 Test Support Equipment

The following equipment was used in support of the DFS testing.

Device	Manufacturer	Model	Description	S/N:	FCC ID:
Master	Applo	A1521	Access Point	C86L3BA8FJ1R	BCGA1521
	Apple	MacBook Air	Controller	C02P41RZG086	QDS-BRCM1072
	Apple	Apple TV	Controller	C0754033HHFP	BCGA1625
		MacBook Air	Controller	C02P41RZG086	QDS-BRCM1072
Client		Kanzi	Lightning Cable	2092FC	N/A
	Dell	U24177HJ	Monitor Display	0RXP1N-74261- 71Q-0APL-A01	N/A

Table 2-5. Test Support Equipment Used

2.5 Master Parameters

Parameters of Master:		
Minimum Antenna Gain	1.4 dBi	
EIRP Level:	>23 dBm	
Access Point Software Version	7.7.9	

Table 2-6. Parameters of Master

2.6 Software and Firmware

The test was done with firmware version 17E228 installed on the EUT.

2.7 EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and/or no modifications were made during testing.

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3.0 DESCRIPTION OF TESTS

3.1 Evaluation Procedure

The measurement procedures described in KDB 905462 D02 v02 were used in the measurement of the EUT. Radiated test methodology was used for the DFS evaluation procedure of the EUT. No deviations to the test procedure and test methods occurred during the evaluation of the EUT.

Deviation from measurement procedure.....None

3.2 Environmental Conditions

The temperature is controlled within range of 15°C to 35°C. The relative humidity is controlled within range of 10% to 75%. The atmospheric pressure is monitored within the range 86-106kPa (860-1060mbar).

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4.0 ANTENNA REQUIREMENTS

Excerpt from §15.203 of the FCC Rules/Regulations:

"An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section."

- The antennas of the EUT are permanently attached.
- There are no provisions for connection to an external antenna.

Conclusion:

The EUT complies with the requirement of §15.203.

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5.0 MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.10-2013. All measurement uncertainty values are shown with a coverage factor of k = 2 to indicate a 95% level of confidence. The measurement uncertainty shown below meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded Uncertainty
Time	± 0.02%

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6.0 TEST EQUIPMENT CALIBRATION DATA

Test Equipment Calibration is traceable to the National Institute of Standards and Technology (NIST). Measurements antennas used during testing were calibrated in accordance to the requirements of ANSI C63.5-2017.

Manufacturer	Model	Description	Cal. Date	Cal. Interval	Cal. Due Date	Serial No.
Aeroflex	3025C	PXI RF Synthesizer	7/25/2018	Biennial	7/25/2020	302570726
Aeroflex	3035C	PXI RF Digitizer	7/25/2018	Biennial	7/25/2020	303570427
ETS-Lindgren	3117	Double Ridged Guide Antenna	3/12/2019	Annual	3/12/2020	205956
Keysight Technologies	N9030A	3 Hz-44GHz PXA Signal Analyzer	8/12/2019	Annual	8/12/2020	MY55330128
Rohde & Schwarz	TC-TA18	Cross Polarized Vivaldi Antenna	11/14/2019	Annual	11/14/2020	101057

 Table 6-1. Annual Test Equipment Calibration Schedule

Note:

For equipment listed above that has a calibration date or calibration due date that falls within the test date range, care was taken to ensure that this equipment was used after the calibration date and before the calibration due date.

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7.0 DESCRIPTION OF DYNAMIC FREQUENCY SELECTION TEST

7.1 Applicability

The following table from KDB 905462 D02 v02 lists the applicable requirements for the DFS testing. The device evaluated in this report is considered a client device without radar detection capability.

	Operational Mode			
Requirement	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 7-1. DFS Applicability

	Operational Mode			
Requirement	Master	Client Without Radar Detection	Client with Radar Detection	
DFS Detection Threshold	Yes	Not required	Yes	
Channel Closing Transmission Time	Yes	Yes	Yes	
Channel Move Time	Yes	Yes	Yes	
U-NII Detection Bandwidth	Yes	Not required	Yes	

Table 7-2. DFS Applicability During Normal Operation

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.

Table 7-3. Additional Requirement for Devices with Multiple Bandwidth Modes

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Per KDB 905462 D02 v02 the operational behavior and individual DFS requirements associated with these modes are as follows:

7.1.1 Master Devices:

- a) The Master Device will use DFS in order to detect Radar Waveforms with received signal strength above the DFS Detection Threshold in the 5250 – 5350 MHz and 5470 – 5725 MHz bands. DFS is not required in the 5150 – 5250 MHz or 5725 – 5850 MHz bands.
- b) Before initiating a network on a Channel, the Master Device will perform a Channel Availability Check for a specified time duration (Channel Availability Check Time) to ensure that there is no radar system operating on the Channel, using DFS described under subsection a) above.
- c) The Master Device initiates a U-NII network by transmitting control signals that will enable other U-NII devices to Associate with the Master Device.
- d) During normal operation, the Master Device will monitor the Channel (In-Service Monitoring) to ensure that there is no radar system operating on the Channel, using DFS described under a).
- e) If the Master Device has detected a Radar Waveform during In-Service Monitoring as described under d), the Operating Channel of the U-NII network is no longer an Available Channel. The Master Device will instruct all associated Client Device(s) to stop transmitting on this Channel within the Channel Move Time. The transmissions during the Channel Move Time will be limited to the Channel Closing Transmission Time.
- f) Once the Master Device has detected a Radar Waveform it will not utilize the Channel for the duration of the Non-Occupancy Period.
- g) If the Master Device delegates the In-Service Monitoring to a Client Device, then the combination will be tested to the requirements described under d) through f) above.

7.1.2 Client Devices:

- a) A Client Device will not transmit before having received appropriate control signals from a Master Device.
- b) A Client Device will stop all its transmissions whenever instructed by a Master Device to which it is associated and will meet the Channel Move Time and Channel Closing Transmission Time requirements. The Client Device will not resume any transmissions until it has again received control signals from a Master Device.
- c) If a Client Device is performing In-Service Monitoring and detects a Radar Waveform above the DFS Detection Threshold, it will inform the Master Device. This is equivalent to the Master Device detecting the Radar Waveform and d) through f) of section 5.1.1 apply.
- d) Irrespective of Client Device or Master Device detection the Channel Move Time and Channel Closing Transmission Time requirements remain the same.
- e) The client test frequency must be monitored to ensure no transmission of any type has occurred for 30 minutes. Note: If the client moves with the master, the device is considered compliant if nothing appears in the client nonoccupancy period test. For devices that shutdown (rather than moving channels), no beacons should appear.

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7.2 DFS Detection Threshold Values

The DFS detection thresholds are defined for Master devices and Client Devices with In-service monitoring. These detection thresholds are listed in the following table.

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 an	ntenna.

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 7-4: Detection Thresholds for Master Devices and Client Devices with Radar Detection

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7.3 DFS Response Requirements

DFS response requirements for Master and Client Devices are listed in the following table.

Parameter	Value
Non-occupancy period	Minimum 30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds See Note1
Channel Closing Transmission Time	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Note 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.

frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.

Table 7-5: DFS Response Requirements

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7.5 Parameters of DFS Test Signals

As the EUT is a Client Device with no Radar Detection only one type radar pulse is required for the testing. Radar Pulse type 0 was used in the evaluation of the Client device for the purpose of measuring the Channel Move Time and the Channel Closing Transmission Time. Table 7-6 lists the parameters for the Short Pulse Radar Waveforms. A plot of the Radar Pulse Type 0 used for testing is included in Section 7.7 of this report.

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	$Roundup\left\{\frac{1}{360},\frac{19.10^6}{PRI_{\mu sec}}\right\}$	60%	30
		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
Aggrega	Aggregate (Radar Types 1-4)				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 7-6: Parameters for Short Pulse Radar Waveforms

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

Table 7-7. Parameters for Long Pulse Radar Waveforms

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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

Table 7-8. Parameters for Frequency Hopping Radar Waveforms

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7.6 System Overview and Procedure

DFS Test Setup:

Radiated DFS Test Setup	\square
Conducted DFS Test Setup	

KDB 905462 D02 v02 describes a radiated test setup and a conducted test setup. The radiated test setup was used for this testing. Figure 7-1 shows the typical test setup. In Band 2C, one channel selected between 5470 and 5725 MHz was chosen for testing.

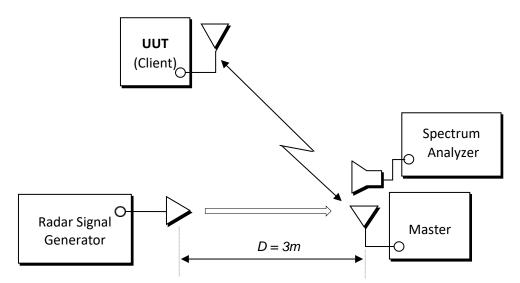


Figure 7-1. Radiated Test Setup for DFS

- 1. The "Aeroflex PXI DFS Radar Simulator and Analyzer Test Suite" is setup to provide a simulated radar pulse at the frequency that the Master and Client are operating. A Type 0 radar pulse was used.
- 2. The Client Device (EUT) is set up per the diagram in Figure 7-1 and communications between the Master device and the Client is established.
- 3. The FCC video test file is streamed from the Master to the Client to properly load the network.
- 4. The "Aeroflex PXI DFS Radar Simulator and Analyzer Test Suite" is set to record and display 12 seconds of time, starting from where the simulated radar is generated. This time domain plot captures any transmissions occurring up to and after 10 seconds. Aggregate time is computed to ensure compliance. (Note: the channel may be different since the Master and Client have changed channels due to the detection of the initial radar pulse.)
- 5. After the initial radar burst the channel is monitored for 30 minutes to ensure no transmissions or beacons occur. A second monitoring setup is used to verify that the Master and Client have both moved to different channels.

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7.7 System Calibration:

The following equipment setup was used to calibrate the Radar Waveform. A spectrum analyzer was used to establish the test signal level for each radar type. During this process, there were no transmissions by either the Master or Client Device. The spectrum analyzer was switched to the zero span (Time Domain) mode at the frequency of the Radar Waveform generator. Peak detection was utilized. The spectrum analyzer resolution bandwidth (RBW) and video bandwidth (VBW) were set to 3 MHz.

The signal generator amplitude is adjusted so that the power level measured at the spectrum analyzer is equal to the DFS detection threshold -64 dBm. The required radiated threshold at the antenna port is -64dBm + 0dBi + 1dB = -63 dBm (Section 7.2).

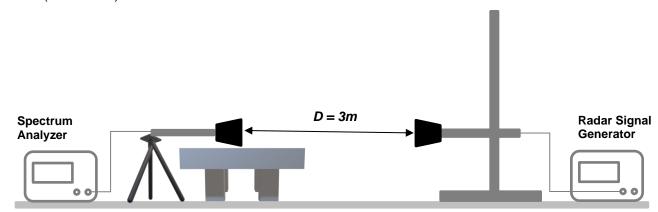


Figure 7-2. Radar Waveform Calibration

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Radar Waveform Calibration Plot:

The radiated plots of the Radar Pulse Signals (Type 0) are given below after performing the system calibration as described in Section 7.7.

Short Pulse Radar Type 0:

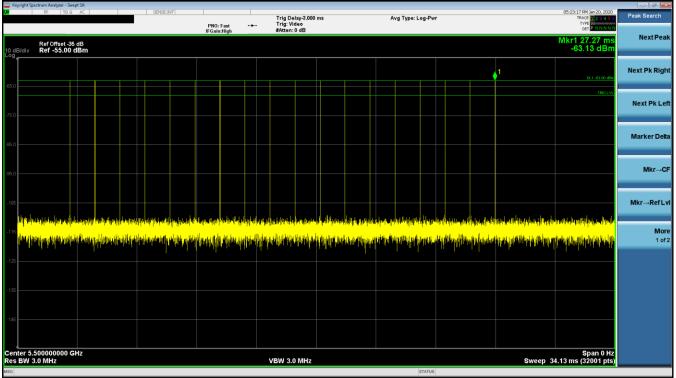


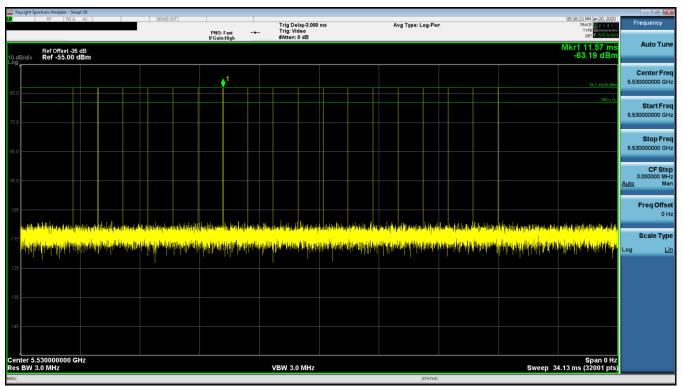
Figure 7-3. 5500MHz – Radar Pulse Type 0 (20MHz)

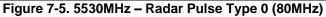
FCC ID: BCGA2228	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Kepsight Spectrum Analyzer - Skept SA RF SO Q AC SERVE: NT	Trig Delay-3.000 PN0: Fast → Trig: Video IFGain:High #Atten: 0 dB	ns Avg Type: Log-Pwr	05:25:35 PM Jan 20, 2020 macci ji 2 star c type cer Entertenter
Ref Offset -35 dB 0 dB/div Ref -55.00 dBm			Mkr1 8.711 ms -63.16 dBm
• • • • • • • • • • • • • • • • • • •			Center Freq 5.510000000 GHz
75 0			5.51000000 GHz
55.0			Stop Freq 5.510000000 GHz
95.0			CF Step 3.000000 MHz <u>Auto</u> Man
	sa a at kasa aka araa kwannin araa		FreqOffset 0Hz
an a stilla an action for a still and a still and a still and a still a still a still a still a still a still a	la piero da presida de la p	e ni fergen en de ser en de se La ser en de ser en d	Scale Type
125			
145			
Senter 5.510000000 GHz			Span 0 Hz
tes BW 3.0 MHz	VBW 3.0 MHz	STATUS	Span 0 Hz Sweep 34.13 ms (32001 pts)

Figure 7-4. 5510MHz – Radar Pulse Type 0 (40MHz)





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8.0 EUT TEST SETUP

The EUT was tested in 4 different test configurations,

Mode 1: Client Mode

Mode 2: Client to Client

Mode 3: Peer to Peer (EUT)

Mode 4: Peer to Peer (Apple TV)

Mode 1: Client Mode

Client is connected to Master (AP) via WLAN network and plays a video test file "6 ½ Magic Hours" in a Server (Laptop). This Server is connected to the Master (AP) via ethernet cable. The Vivaldi antenna is adjusted so that the WLAN traffic level, as displayed on the spectrum analyzer, is at lower amplitude than the radar detection threshold.

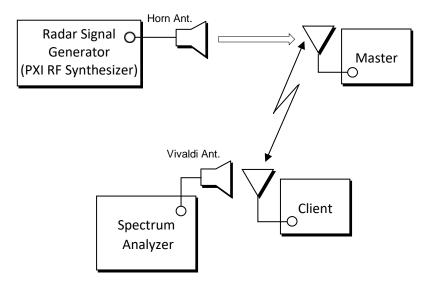


Figure 8-1. Test Setup (Mode 1)

FCC ID: BCGA2228	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Mode 2: Client-to-Client Communications Mode

Client plays the video test file that is streamed to generate WLAN while linked to Master and streamed the video through Apple TV to Monitor display. The Vivaldi antenna is adjusted so that the WLAN traffic level, as displayed on the spectrum analyzer, is at lower amplitude than the radar detection threshold.

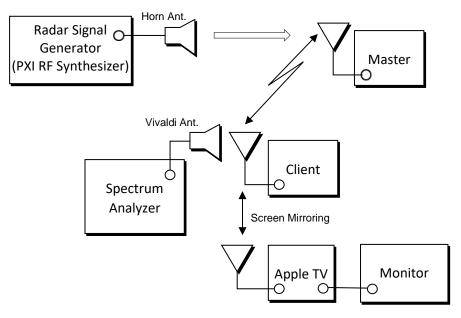


Figure 8-2. Test Setup (Mode 2)

FCC ID: BCGA2228	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Mode 3: Peer-to-Peer (EUT) Communications Mode

Generate and inject additional transmission:

- 1. Client and Apple TV must be linked to the Master.
- 2. Client plays video that is saved within its internal storage and begin mirroring screen via Apple TV.
- 3. Connect the Apple TV and Client to the support laptop and initiate additional transmission using iPerf.
- 4. After the additional transmission is injected, the Client must be disconnected to the Master.
- 5. Client stops and re-start mirroring screen.

Client plays video that is saved within its internal storage and streamed through Apple TV to the Monitor display. The receive antenna/ monitoring antenna is placed near the EUT. Additional data traffic was sent from the EUT (Client) to Apple TV (Server) using iPerf. The Vivaldi antenna is adjusted so that the WLAN traffic level, as displayed on the spectrum analyzer, is at lower amplitude than the radar detection threshold.

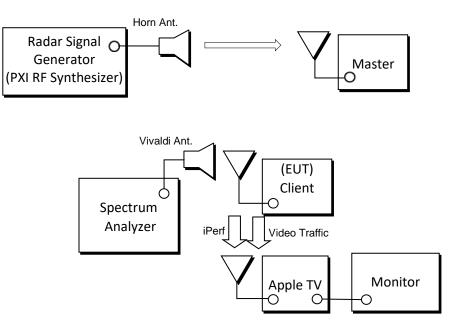


Figure 8-3. Test Setup (Mode 3)

FCC ID: BCGA2228	<u><u><u></u><u>PCTEST</u></u></u>	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Mode 4: Peer-to-Peer (Apple TV) Communications Mode

Generate and inject additional transmission:

- 1. Client and Apple TV must be linked to the Master.
- 2. Client plays video that is saved within its internal storage and begin mirroring screen via Apple TV.
- 3. Connect the Apple TV and Client to the support laptop and initiate additional transmission using iPerf.
- 4. After the additional transmission is injected, the Client must be disconnected to the Master.
- 5. Client stops and re-start mirroring screen.

Client plays video that is saved within its internal storage and streamed through Apple TV to the Monitor display. The receive antenna/ monitoring antenna is placed near the Apple TV. Additional data traffic was sent from the Apple TV (Client) to the EUT (Server) using iPerf. The Vivaldi antenna is adjusted so that the WLAN traffic level, as displayed on the spectrum analyzer, is at lower amplitude than the radar detection threshold.

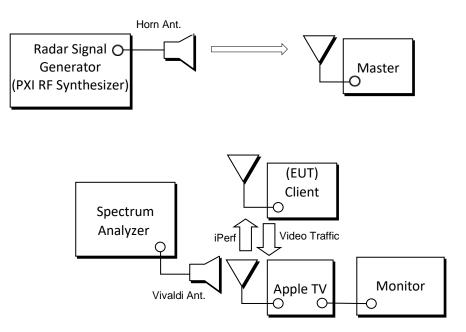


Figure 8-4. Test Setup (Mode 4)

In summary, for Modes 1 and Mode 2, Client is linked to the Master, and for Modes 3 and Mode 4, Client is not linked to the Master.

FCC ID: BCGA2228	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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9.0 **TEST RESULTS**

9.1 Summary

Company Name: FCC ID: FCC Classification: Apple Inc.

BCGA2228

Unlicensed National Information Infrastructure (UNII)

			Measured				
	Mode	Parameter	20MHz Bandwidth	40MHz Bandwidth	80MHz Bandwidth	Limit	Result
		Channel Move Time	4.237 s	4.045 s	0.155 s	10 seconds	Pass
	1 Client Mode	Channel Closing Transmission Time	< 200ms + 18.377 ms (aggregate)	< 200ms + 17.798 ms (aggregate)	< 200ms + 0.0 ms (aggregate)	200 ms + aggregate of 60ms over remaining 10 second period	Pass
la)		Non- Occupancy Period	Monitored for 30 minutes with no client transmission	Monitored for 30 minutes with no client transmission	Monitored for 30 minutes with no client transmission	30 Minutes	Pass
anad		Channel Move Time	4.032 s	4.097 s	0.202 s	10 seconds	Pass
z ISED C	6 excluding 5600-5650 MHz for ISED Canada) Client for ISED Canada) Client ONII – 2C Band UNII – 2C Band Client ONII – 2C Band	Channel Closing Transmission Time	< 200ms + 17.464 ms (aggregate)	< 200ms + 17.910 ms (aggregate)	< 200ms + 0.0 ms (aggregate)	200 ms + aggregate of 60ms over remaining 10 second period	Pass
5725 MH DMHz for 2C Banc		Non- Occupancy Period	Monitored for 30 minutes with no client transmission	Monitored for 30 minutes with no client transmission	Monitored for 30 minutes with no client transmission	30 Minutes	Pass
0 – [5650 III – 1		Channel Move Time	4.052 s	4.126 s	0.131 s	10 seconds	Pass
547 g 5600-{ UN	3 Peer to Peer	Channel Closing Transmission Time	< 200ms 17.250 ms (aggregate)	< 200ms + 16.240 ms (aggregate)	< 200ms + 0.0 ms (aggregate)	200 ms + aggregate of 60ms over remaining 10 second period	Pass
xcludin	(EUT)	Non- Occupancy Period	Monitored for 30 minutes with no client transmission	Monitored for 30 minutes with no client transmission	Monitored for 30 minutes with no client transmission	30 Minutes	Pass
e)	(e	Channel Move Time	4.046 s	4.225 s	0.191 s	10 seconds	Pass
	4 Peer to Peer	Channel Closing Transmission Time	< 200ms + 20.005 ms (aggregate)	< 200ms + 0.746 ms (aggregate)	< 200ms + 0.0 ms (aggregate)	200 ms + aggregate of 60ms over remaining 10 second period	Pass
	(Apple TV)	Non- Occupancy Period	Monitored for 30 minutes with no client transmission	Monitored for 30 minutes with no client transmission	Monitored for 30 minutes with no client transmission	30 Minutes	Pass

Table 9-1. Summary of Test Results

FCC ID: BCGA2228	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Notes:

- 1) The EUT was found to be compliant with the requirements for DFS as required for a Client Device per Part 15.407(h), RSS-247 and KDB 905462 D02 v02.
- 2) Automated test software was used to measure emissions and capture the corresponding plots necessary to show compliance. The list is given below,
 - DFS threshold count v1.1
 - DFS Radar Simulator and Analyzer v2.8 (Aeroflex Inc.)
 - iPerf Software

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9.2 Channel Loading

9.2.1 Channel Loading Mode 1:

Channel Loading Notes:

Per KDB 905462 D02 v02, timing plots are required with calculations demonstrating a minimum channel loading of approximately 17% or greater. Channel loading can be estimated by setting the spectrum analyzer for zero span and approximate the transmission time.

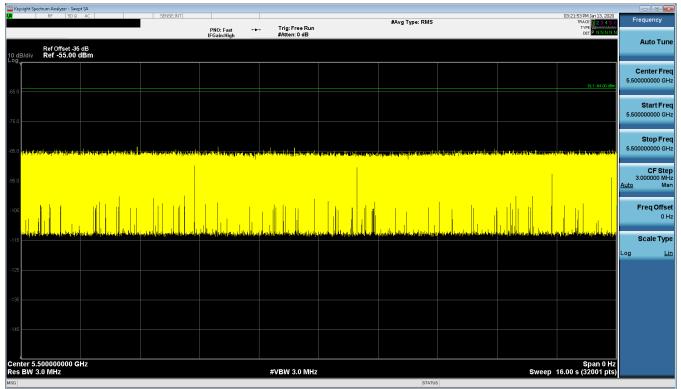


Figure 9-1. 5500MHz - Channel Loading - Mode 1 (20MHz)

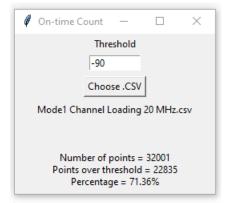


Figure 9-2. 5500MHz - Channel Loading Calculation - Mode 1 (20MHz)

FCC ID: BCGA2228	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	
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Keysight Spectrum Analyzer - Sw RF 50 S		SENSE:INT							03:27:06 PM Jan 13, 2020	
14 303	2 AC	Schocann	PNO: Fast IFGain:High	Trig: Free Run #Atten: 0 dB		#Avg Type: RMS			TRACE 2 3 4 5 6 TYPE WANNAM	Frequency
Ref Offset -3 dB/div Ref -55.00	35 dB) dBm									Auto Tune
9										Center Free 5.510000000 GH:
.0									DL1 -64.00 dBm	
.0										Start Free 5.510000000 GH
										Stop Fre
.0										5.510000000 GH
unanderlingklunderbe 0	in de la companya de La companya de la comp	nderskilde bij die keine bestelselders	ha an ann an ann an ann an ann an ann an	hadd dag dag yn gan yw yn gan dag yn gan dag yn gan dag yn gan dag yn gan gan gan gan gan gan gan gan gan ga	akilaliyatea bashkatida ariti	dang pinilinti <mark>natatin nata</mark>	héndi tu anjanta yili jiladi sete	iter, geografik de mederationen i	n i eddiod bhaire e dhaint Undhaire	CF Stej 3.000000 MH <u>Auto</u> Ma
5							Uly Million page 10 (1000 and	and the second states and		Freq Offse 0 ⊢
15					n a handlicht freisinner benedenen ob		and the second of the second o			Scale Typ
										Log <u>L</u>
25										
35										
45										
enter 5.510000000 s BW 3.0 MHz	GHz			#VBW 3.0 MHz				Sweep	Span 0 Hz 16.00 s (32001 pts)	
6						STATU	s			

Figure 9-3. 5510MHz - Channel Loading - Mode 1 (40MHz)

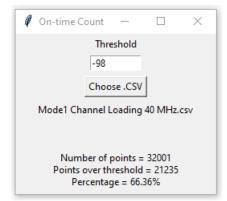


Figure 9-4 5510MHz - Channel Loading Calculation - Mode 1 (40MHz)

FCC ID: BCGA2228	<u><u><u>PCTEST</u></u></u>	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 27 of 54
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Keys	ight Spectrum Analyzer - Sw										
	RF 50 \$	AC .	SENSE:INT	PNO: Fast ↔ IFGain:High			#Avg Type: RMS			06:04:38 PM Jan 13, 2020 TRACE 2 3 4 5 6 TYPE WWWWWW DET P N N N N N	Frequency
10 dE Log_	Ref Offset -3 Idiv Ref -55.00	5 dB dBm									Auto Tune
-65.0										DL1 -64.00 øBin	Center Freq 5.530000000 GHz
-75.0											Start Freq 5.530000000 GHz
-85.0											Stop Freq 5.530000000 GHz
-95.0	ikan sakata din sa di	li i ddina i ata	Julianski franciski starova	art na fi. Ji standhari kan damaran sa	tula. Anarro anarotiki tak	ulinate cate and a first of	adasan katika karan karan akika	distant and the solution of the	a da tana antana	and a post of the same that	CF Step 3.000000 MHz <u>Auto</u> Man
-105											Freq Offset 0 Hz
-115 -											Scale Type Log <u>Lin</u>
-125											
-135											
-145 -											
Center 5.53000000 GHz Span 0 Hz Res BW 3.0 MHz \$weep 16.00 s (32001 pts)											

Figure 9-5. 5530MHz - Channel Loading - Mode 1 (80MHz)

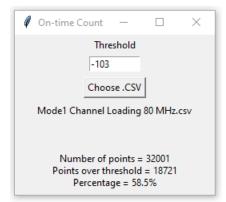


Figure 9-6. 5530MHz - Channel Loading Calculation - Mode 1 (80MHz)

FCC ID: BCGA2228	<u><u><u></u><u>PCTEST</u></u></u>	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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9.2.2 Channel Loading Mode 2:

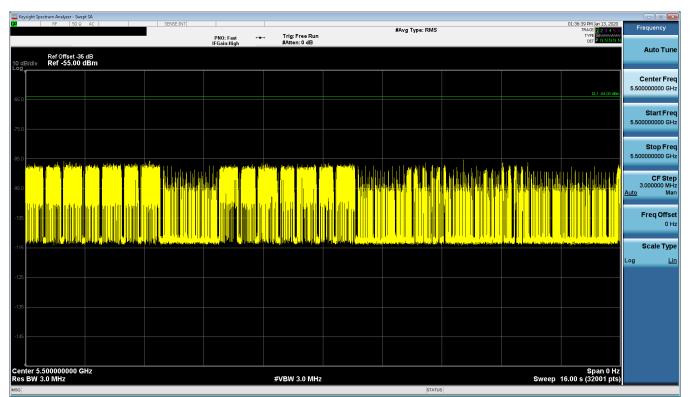


Figure 9-7. 5500MHz - Channel Loading - Mode 2 (20MHz)

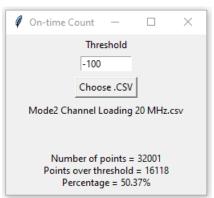


Figure 9-8. 5500MHz - Channel Loading Calculation - Mode 2 (20MHz)

FCC ID: BCGA2228	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 20 of 54
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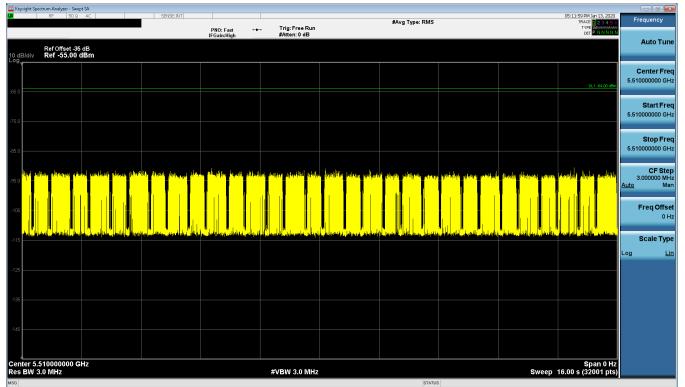


Figure 9-9. 5510MHz - Channel Loading - Mode 2 (40MHz)

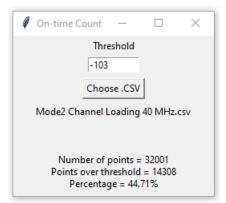


Figure 9-10 5510MHz - Channel Loading Calculation - Mode 2 (40MHz)

FCC ID: BCGA2228	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 20 of 54
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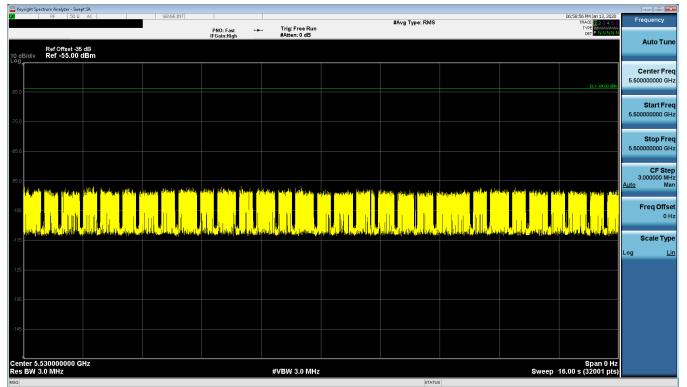


Figure 9-11. 5530MHz - Channel Loading - Mode 2 (80MHz)

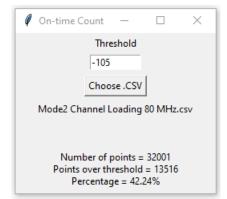


Figure 9-12. 5530MHz - Channel Loading Calculation - Mode 2 (80MHz)

FCC ID: BCGA2228	<u><u><u></u><u>PCTEST</u></u></u>	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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9.2.3 Channel Loading Mode 3:

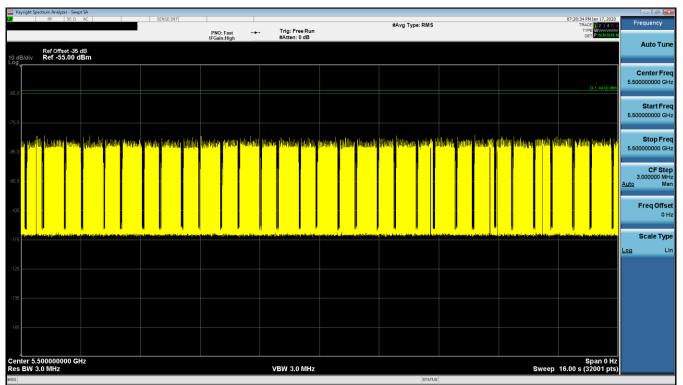


Figure 9-13. 5500MHz - Channel Loading - Mode 3 (20MHz)

🖉 On-time Count	_		×		
Thr -98	eshold				
Choose .CSV Mode3 Channel Loading 20 MHz.csv					
Number of points = 32001 Points over threshold = 11893 Percentage = 37.16%					

Figure 9-14. 5500MHz - Channel Loading Calculation - Mode 3 (20MHz)

FCC ID: BCGA2228	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	Daga 22 of 54
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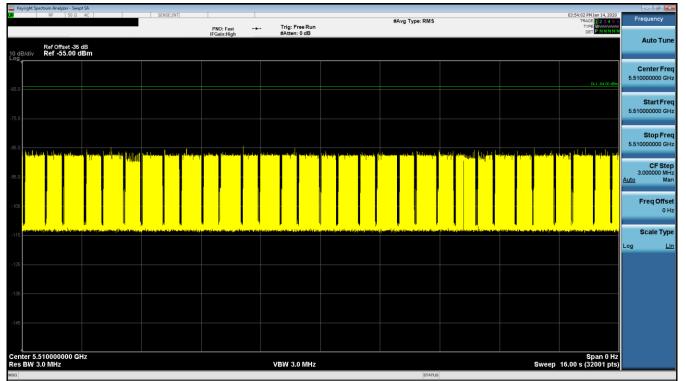


Figure 9-15. 5510MHz - Channel Loading - Mode 3 (40MHz)

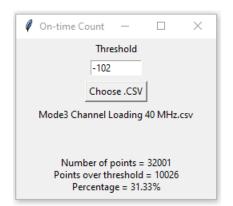


Figure 9-16 5510MHz - Channel Loading Calculation - Mode 3 (40MHz)

FCC ID: BCGA2228	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	Daga 22 of 54
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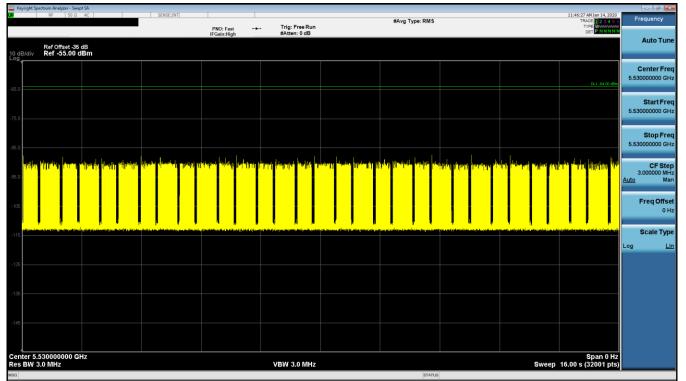


Figure 9-17. 5530MHz - Channel Loading - Mode 3 (80MHz)

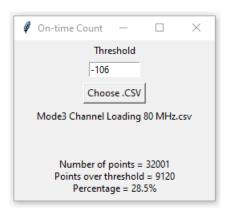


Figure 9-18. 5530MHz - Channel Loading Calculation - Mode 3 (80MHz)

FCC ID: BCGA2228	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 24 of 54
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9.2.4 Channel Loading Mode 4:

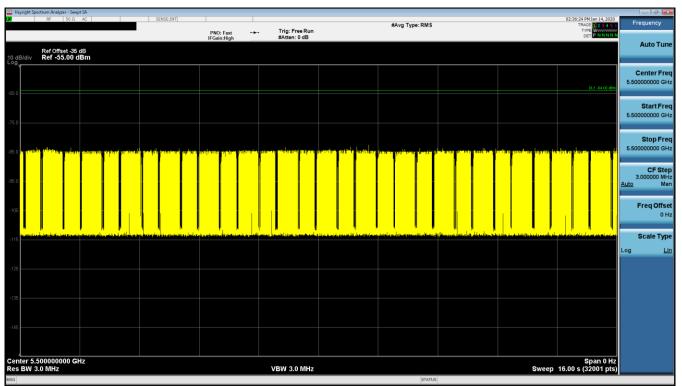


Figure 9-19. 5500 MHz - Channel Loading - Mode 4 (20MHz)

🖉 On-time Count	_		×		
Thr -98	eshold				
Choose .CSV Mode4 Channel Loading 20 MHz.csv					
Number of points = 32001 Points over threshold = 10713 Percentage = 33.48%					

Figure 9-20. 5500MHz - Channel Loading Calculation - Mode 4 (20MHz)

FCC ID: BCGA2228	<u><u><u></u><u>PCTEST</u></u></u>	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager	
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∑ Keysight Spectrum Annlyzer - Swept SA R RF 50 Ω AC SENSE:INT	PNO: Fast Trig: Free Run IFGain:High #Atten: 0 dB	#Avg Type: RMS		03:15:49 PM Jan 14, 2020 TRACE 12.23 4 5 6 TYPE WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
Ref Offset -35 dB 10 dB/div Ref -55.00 dBm				Auto Tune
66.0				Center Freq 5.510000000 GHz
75.0				Start Freq 5.51000000 GHz
85.0				Stop Freq 5.510000000 GHz
os o 105 - 105 - 105 - 105 - 105 - 105 - 105 - 105 - 105 - 105 - 105 - 105 - 105 - 105 - 105 - 105 - 105 - 105 - 105 105 - 105 - 105 - 105 - 105 - 105 - 105 - 105 - 105 - 105 - 105 - 105 - 105 - 105 - 105 - 105 - 105 - 105 - 105	hts assume benerice with the balance where been	se locite (specije blich recoule) kervi brevo	is blocked frankriger landdy gylferhaft fannan fadlynni	CF Step 3.00000 MH2 Auto Freq Offset 0 H2
	n na sense di sense d	1990 yn Alfan de e seither Earlacha, grannen (n-Ataliach, pollarad) blei Marada, mhar	a ta yan manda da an birana da an an ar an yan da an	Log Lin
-125				
-195				
-145				
Center 5.510000000 GHz Res BW 3.0 MHz	VBW 3.0 MHz	STATUS		Span 0 Hz 16.00 s (32001 pts)

Figure 9-21. 5510MHz - Channel Loading - Mode 4 (40MHz)

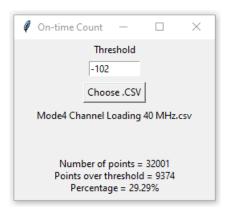


Figure 9-22. 5510MHz - Channel Loading Calculation - Mode 4 (40MHz)

FCC ID: BCGA2228	<u><u><u>PCTEST</u></u></u>	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dage 20 of 54	
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Keysight Spectrum Analyzer - Swept SA RF 50 Ω AC		SENSE:INT	PNO: Fast	Trig: Free Run		#Avg Type: RMS			01:55:47 PM Jan 14, 2020 TRACE 1 2 3 4 5 6 TYPE WWWWWW DET PNNNNN	Frequency
Ref Offset -35 dB 0 dB/div Ref -55.00 dBm			PNO: Fast → IFGain:High	_ Trig: Free Run #Atten: 0 dB					DET PNNNN	Auto Tune
og									DL1 -64.00 dBm	Center Freq 5.53000000 GHz
75.0										Start Free 5.53000000 GHz
5.0										Stop Free 5.530000000 GH:
16.0	hul historia history h									CF Step 3.000000 MHz <u>Auto</u> Man
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145										
enter 5.530000000 GHz les BW 3.0 MHz				VBW 3.0 MHz		STATUS		Sweep	Span 0 Hz 16.00 s (32001 pts)	

Figure 9-23. 5530MHz - Channel Loading - Mode 4 (80MHz)

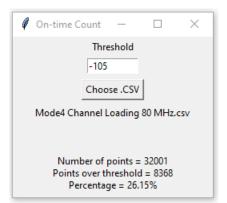


Figure 9-24. 5530MHz - Channel Loading Calculation - Mode 4 (80MHz)

FCC ID: BCGA2228	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	Dega 27 of 54
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9.3 Channel Move/ Closing Transmission Time

9.3.1 Channel Move/ Closing Transmission Time Mode 1:

<u>Result</u>

Parameter	20MHz Bandwidth	40MHz Bandwidth	80MHz Bandwidth	Limit
Channel Move Time	4.237 s	4.045 s	0.155 s	10 seconds
Channel Closing Transmission Time	< 200ms + 18.377 ms (aggregate)	< 200ms + 17.798 ms (aggregate)	< 200ms + 0.0 ms (aggregate)	200 ms + aggregate of 60ms over remaining 10 second period

Notes:

- 1. The pulses shown in the plots below have been determined to be from the Master AP.
- 2. Marker Info and Aggregate time results are shown on the right side of the plots below.

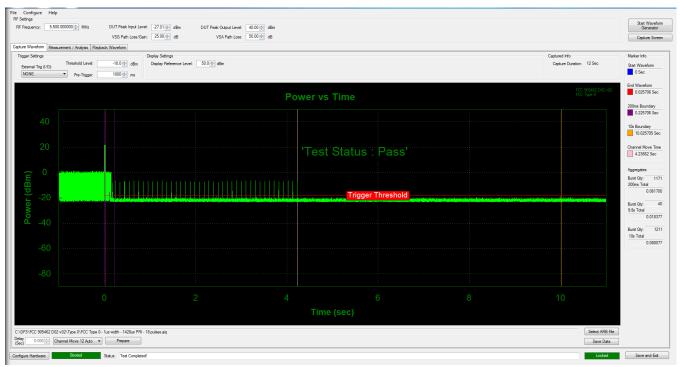


Figure 9-25. 5500MHz - Channel Move/ Closing Transmission Time - Mode 1 (20 MHz)

FCC ID: BCGA2228	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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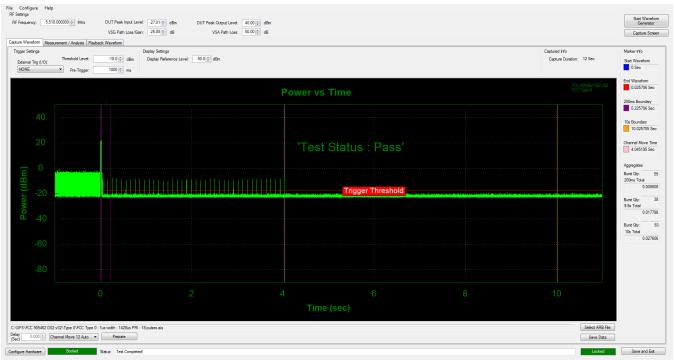


Figure 9-26. 5510MHz - Channel Move/ Closing Transmission Time - Mode 1 (40 MHz)

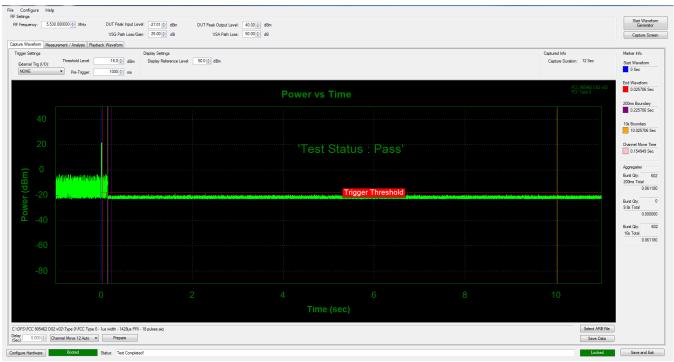


Figure 9-27. 5530MHz - Channel Move/ Closing Transmission Time - Mode 1 (80 MHz)

FCC ID: BCGA2228	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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9.3.2 Channel Move/ Closing Transmission Time Mode 2:

Result:

Parameter	20MHz Bandwidth	40MHz Bandwidth	80MHz Bandwidth	Limit
Channel Move Time	4.032 s	4.097 s	0.202 s	10 seconds
Channel Closing Transmission Time	< 200ms + 17.464 ms (aggregate)	< 200ms + 17.910 ms (aggregate)	< 200ms + 0.0 ms (aggregate)	200 ms + aggregate of 60ms over remaining 10 second period

Notes:

- 1. The pulses shown in the plots below have been determined to be from the Master AP.
- 2. Marker Info and Aggregate time results are shown on the right side of the plots below.

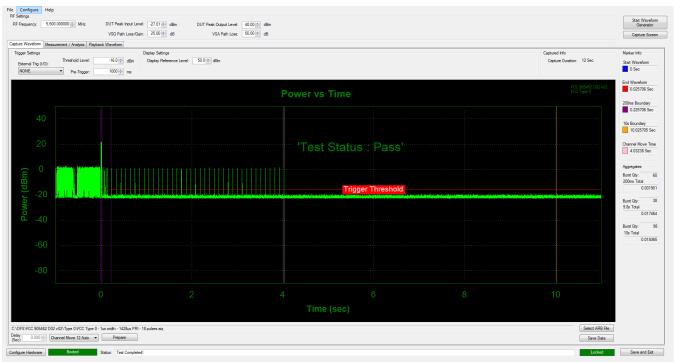
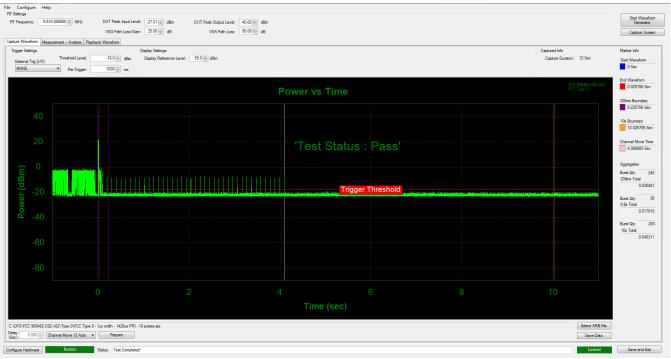


Figure 9-28. 5500MHz - Channel Move/ Closing Transmission Time - Mode 2 (20 MHz)

FCC ID: BCGA2228	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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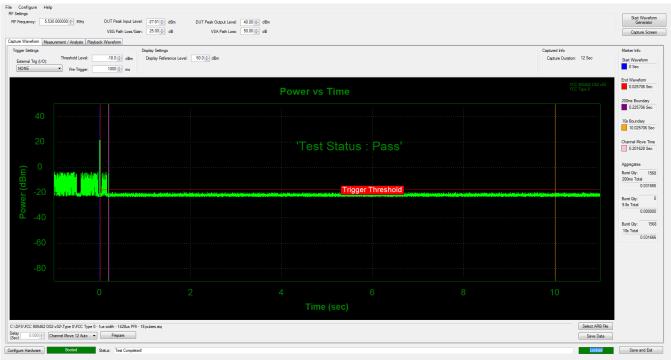


Figure 9-30. 5530MHz - Channel Move/ Closing Transmission Time - Mode 2 (80 MHz)

FCC ID: BCGA2228	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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9.3.3 Channel Move/ Closing Transmission Time Mode 3:

Result:

Parameter	20MHz Bandwidth	40MHz Bandwidth	80MHz Bandwidth	Limit
Channel Move Time	4.052 s	4.126 s	0.131 s	10 seconds
Channel Closing Transmission Time	< 200ms 17.250 ms (aggregate)	< 200ms + 16.240 ms (aggregate)	< 200ms + 0.0 ms (aggregate)	200 ms + aggregate of 60ms over remaining 10 second period

Notes:

- 1. The pulses shown in the plots below have been determined to be from the Master AP.
- 2. Marker Info and Aggregate time results are shown on the right side of the plots below.

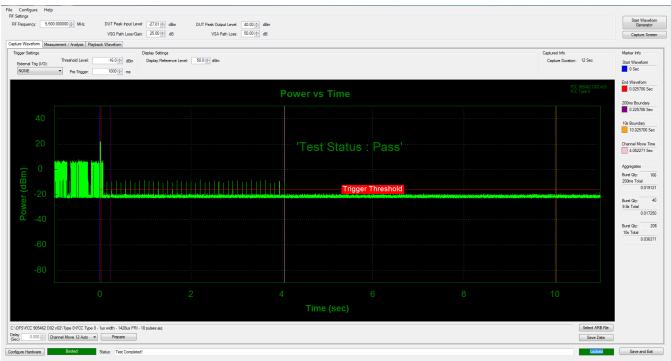


Figure 9-31. 5500MHz - Channel Move/ Closing Transmission Time - Mode 3 (20 MHz)

FCC ID: BCGA2228	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 40 of 54
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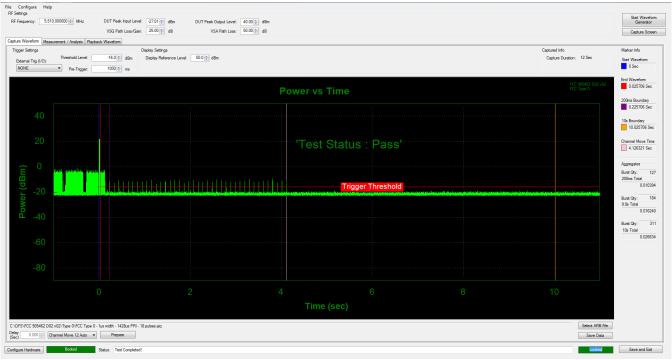


Figure 9-32. 5510MHz - Channel Move/ Closing Transmission Time - Mode 3 (40 MHz)

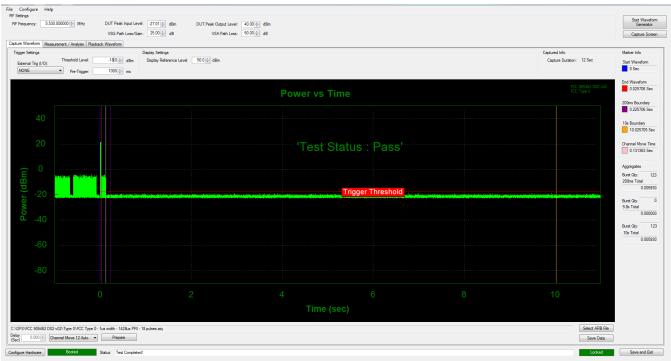


Figure 9-33. 5530MHz - Channel Move/ Closing Transmission Time - Mode 3 (80 MHz)

FCC ID: BCGA2228	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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9.3.4 Channel Move/ Closing Transmission Time Mode 4:

Result:

Parameter	20MHz Bandwidth	40MHz Bandwidth	80MHz Bandwidth	Limit
Channel Move Time	4.046 s	4.225 s	0.191 s	10 seconds
Channel Closing Transmission Time	< 200ms + 20.005 ms (aggregate)	< 200ms + 0.746 ms (aggregate)	< 200ms + 0.0 ms (aggregate)	200 ms + aggregate of 60ms over remaining 10 second period

Notes:

- 1. The pulses shown in the plots below have been determined to be from the Master AP.
- 2. Marker Info and Aggregate time results are shown on the right side of the plots below.

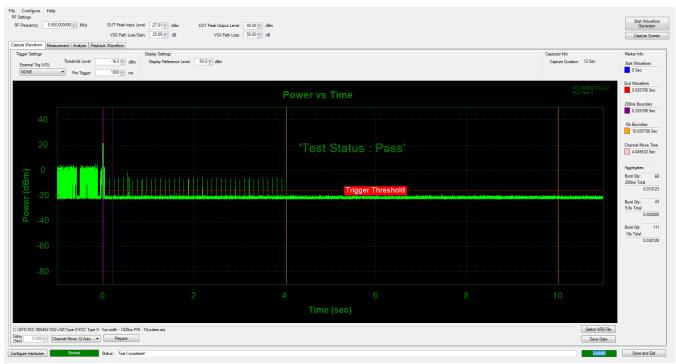


Figure 9-34. 5500MHz - Channel Move/ Closing Transmission Time - Mode 4 (20 MHz)

FCC ID: BCGA2228	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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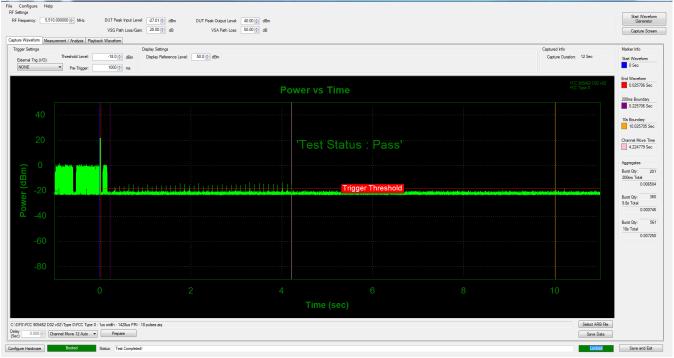


Figure 9-35. 5510MHz - Channel Move/ Closing Transmission Time - Mode 4 (40 MHz)

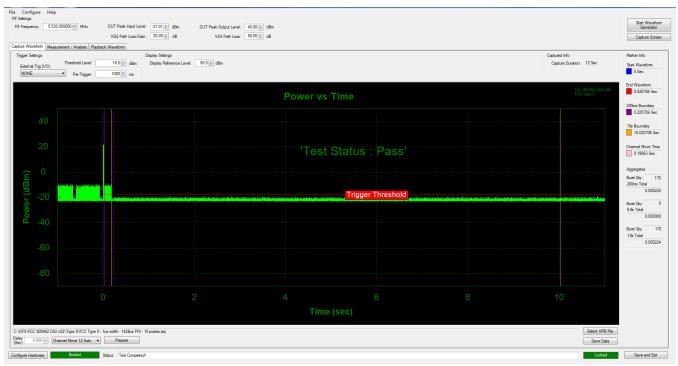


Figure 9-36. 5530MHz - Channel Move/ Closing Transmission Time - Mode 4 (80 MHz)

FCC ID: BCGA2228	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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9.4 Non-Occupancy Period

9.4.1 Non-Occupancy Period (30 Minutes) Mode 1:

Notes:

1. No frequency transmission detected during the Non-Occupancy Period of 30 minutes monitoring.

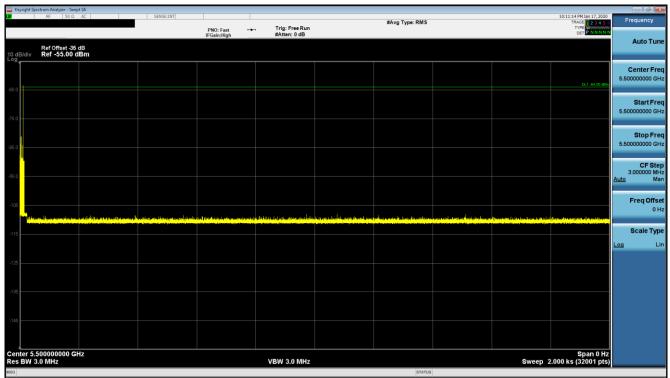


Figure 9-37. 5500MHz - Non-Occupancy Period (30 Minutes) - Mode 1 (20MHz)

FCC ID: BCGA2228	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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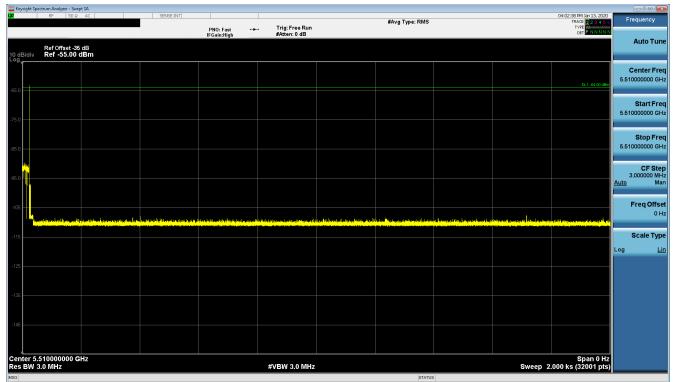


Figure 9-38. 5510MHz - Non-Occupancy Period (30 Minutes) - Mode 1 (40MHz)

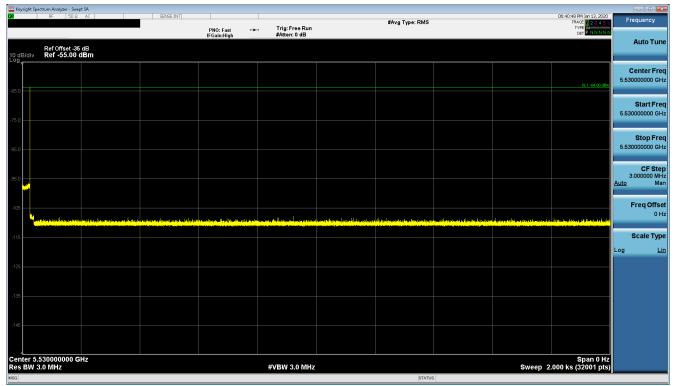


Figure 9-39. 5530MHz - Non-Occupancy Period (30 Minutes) - Mode 1 (80MHz)

FCC ID: BCGA2228	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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9.4.2 Non-Occupancy Period (30 Minutes) Mode 2:

Notes:

1. No frequency transmission detected during the Non-Occupancy Period of 30 minutes monitoring.

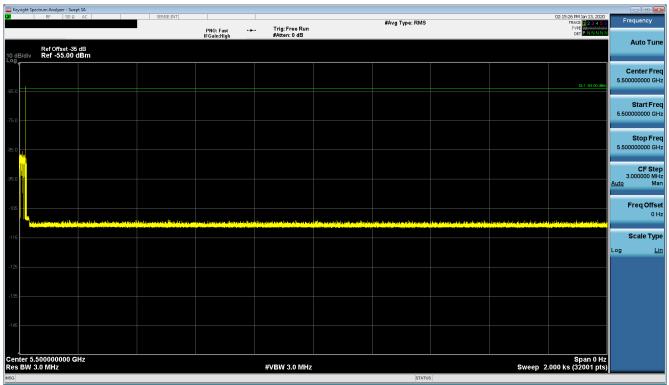


Figure 9-40. 5500MHz - Non-Occupancy Period (30 Minutes) - Mode 2 (20MHz)

FCC ID: BCGA2228	<u><i>CPCTEST</i></u>	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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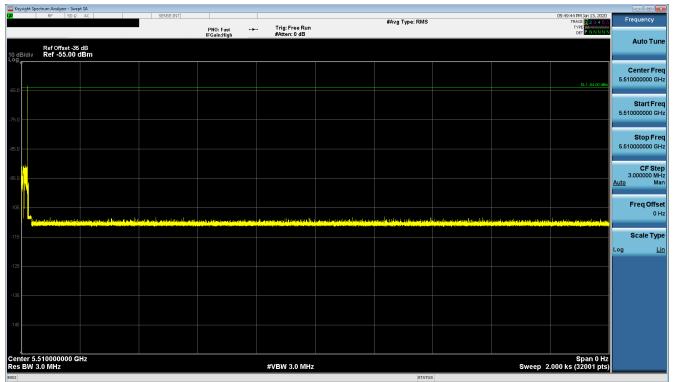


Figure 9-41. 5510MHz - Non-Occupancy Period (30 Minutes) - Mode 2 (40MHz)

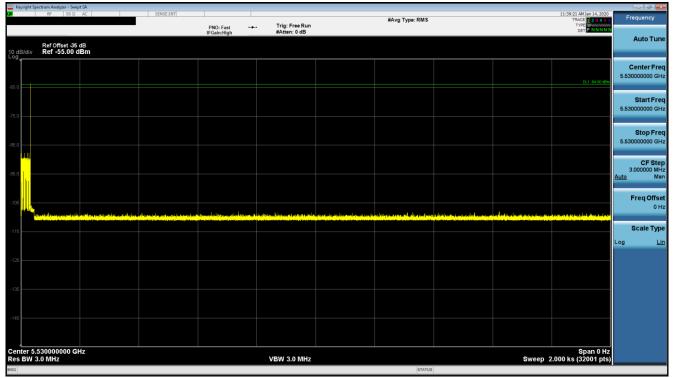


Figure 9-42. 5530MHz - Non-Occupancy Period (30 Minutes) - Mode 2 (80MHz)

FCC ID: BCGA2228	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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9.4.3 Non-Occupancy Period (30 Minutes) Mode 3:

Notes:

2. No frequency transmission detected during the Non-Occupancy Period of 30 minutes monitoring.

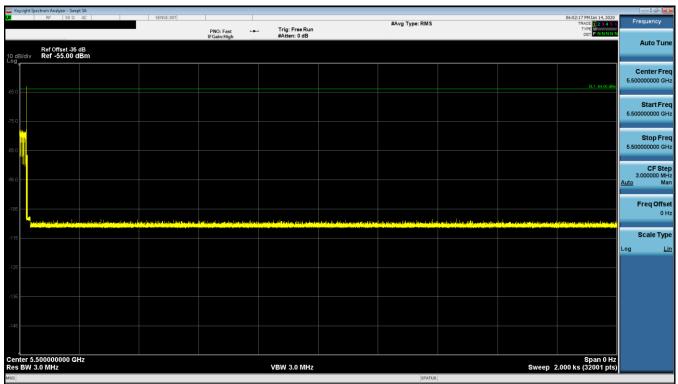


Figure 9-43. 5500MHz - Non-Occupancy Period (30 Minutes) - Mode 3 (20MHz)

FCC ID: BCGA2228	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Center Fre 55 10000000 G 5 1000000 G 5 1000000 G 5 1000000 G 5 100000 G 5 100000 G 5 100000 G 5 100000 G 5 100000 G 5 100000 G 5 10000 G 5 100	Ref Offset -35 dB dB/div Ref -55.00 dBm g									Auto Tu
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Figure 9-44. 5510MHz - Non-Occupancy Period (30 Minutes) - Mode 3 (40MHz)

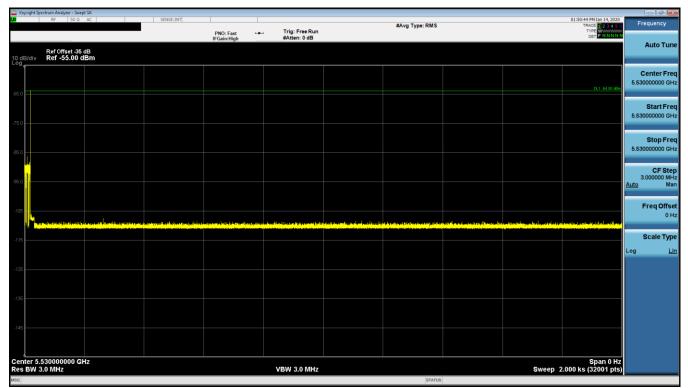


Figure 9-45. 5530MHz - Non-Occupancy Period (30 Minutes) - Mode 3 (80MHz)

FCC ID: BCGA2228	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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9.4.4 Non-Occupancy Period (30 Minutes) Mode 4:

Notes:

1. No frequency transmission detected during the Non-Occupancy Period of 30 minutes monitoring.

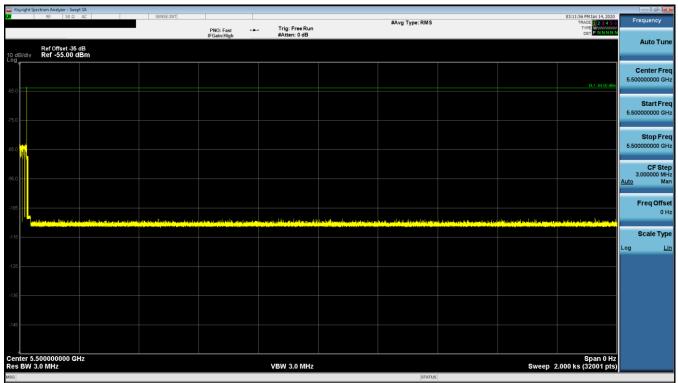


Figure 9-46. 5500MHz - Non-Occupancy Period (30 Minutes) - Mode 4 (20MHz)

FCC ID: BCGA2228	<u><u><u></u><u>PCTEST</u></u></u>	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Swept SA RF 50 Ω AC SENSE:INT			03:50:17 PM Jan 14, 2020
N Nº SU Q AL SERIE: MI	PNO: Fast Trig: Free Run IFGain:High #Atten: 0 dB	#Avg Type: RMS	TRACE 2334 CC TYPE DET PINNINN DET PINNINN
Ref Offset -35 dB 10 dB/div Ref -55.00 dBm			Auto Tu
-65.0			Center Fr 5.510000000 G
-75.0			Start Fr 5.51000000 G
			Stop Fr 5.51000000 G
			CF St 3.00000 M
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-125			
-135			
-145			
Center 5.510000000 GHz Res BW 3.0 MHz	VBW 3.0 MHz	STATUS	Span 0 Hz Sweep 2.000 ks (32001 pts)

Figure 9-47. 5510MHz - Non-Occupancy Period (30 Minutes) - Mode 4 (40MHz)

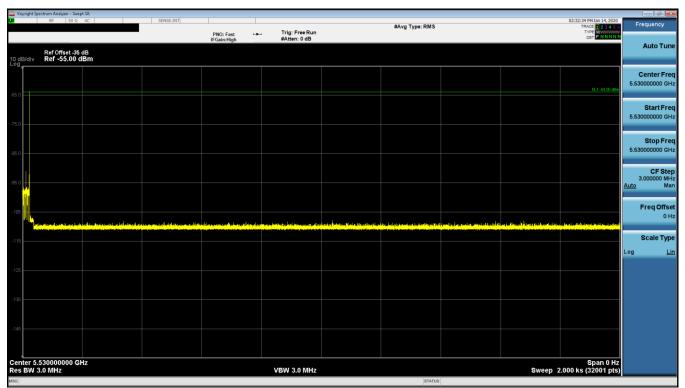


Figure 9-48. 5530MHz - Non-Occupancy Period (30 Minutes) - Mode 4 (80MHz)

FCC ID: BCGA2228	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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10.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Apple Tablet Device FCC ID: BCGA2228** is in compliance with the DFS requirements for a Client Device without radar detection in accordance with Part 15.407 of the FCC Rules and RSS-247 of the Innovation, Science and Economic Development Canada Rules.

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