

# DFS PORTION of FCC 47 CFR PART 15 SUBPART E DFS PORTION of ISED CANADA RSS-247 ISSUE 2

**CERTIFICATION TEST REPORT** 

FOR

**SMARTPHONE** 

MODEL NUMBER: A2481 (PARENT MODEL) A2626, A2628, A2629, A2630 (VARIANT MODELS)

MODEL NUMBER TESTED: A2481

FCC ID: BCG-E3994A (Parent Model) BCG-E3996A, BCG-E4029A, BCG- E4030A, BCG- E4030A (Variant Models)

ISED ID: 579C- E3994A (Parent Model) 579C- E3996A, 579C- E4029A, 579C- E4030A, 579C- E4030A (Variant Models)

REPORT NUMBER: 13573777-E19V2

ISSUE DATE: AUGUST 05, 2021

Prepared for APPLE, INC. 1 APPLE PARK WAY CUPERTINO CA 95014, U.S.A

Prepared by UL VERIFICATION SERVICES INC. 47173 BENICIA STREET FREMONT, CA 94538, U.S.A. TEL: (510) 319-4000 FAX: (510) 661-0888



# **Revision History**

Rev.	lssue Date	Revisions	Revised By
V1	06/18/2021	Initial Issue	Doug Anderson
V2	08/05/2021	Removed FCC/IC ID from letterhead, update section 4 without revision, update page 16 RF vector Cal date	Chin Pang

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Complies Complies

# **1. ATTESTATION OF TEST RESULTS**

	STANDARD	TEST RESULTS
	APPLICABLE STANDARDS	
DATE TESTED:	MAY 11 to 13, 2021	
SERIAL NUMBER:	J45VHJ2VL2	
MODEL TESTED:	A2481	
MODEL NUMBER:	A2481 (PARENT MODEL) A2626, A2628, A2629, A2630 (VAI	RIANT MODELS)
EUT DESCRIPTION:	SMARTPHONE	
COMPANY NAME:	APPLE, INC. 1 APPLE PARK WAY CUPERTINO, CA 95014, U.S.A.	

DFS Portion of ISED CANADA RSS-247 Issue 2
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DFS Portion of CFR 47 Part 15 Subpart E

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise.

This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by A2LA, NIST, any agency of the Federal Government, or any agency of the U.S. government.

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Approved & Released For UL Verification Services Inc. By:

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Douglas Combuser

DOUG ANDERSON Test Engineer CONSUMER TECHNOLOGY DIVISION UL Verification Services Inc.

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# 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with the DFS portion of FCC CFR 47 Part 2, FCC CFR 47 Part 15, FCC KDB 789033, KDB 905462 D02 and D03 and RSS-247 Issue 2.

# 3. SUMMARY OF TEST RESULTS

Requirement Description	Result	Remarks
DFS Portion of FCC 47 CFR PART 15 SUBPART E	Complies	
DFS Portion of ISED CANADA RSS-247 ISSUE 2	Complies	

# 4. REFERENCE DOCUMENTS

Measurements of transmitter parameters as referenced in this report and all other manufacturer's declarations relevant to the RF test requirements are documented in UL Verification Services report number 13573777-E5 & E6 FCC\_IC INII Conducted Report".

This report contains data provided by the customer which can impact the validity of results. UL Verification Services Inc. is only responsible for the validity of results after the integration of the data provided by the customer.

# 5. FACILITIES AND ACCREDITATION

UL Verification Services Inc. is accredited by A2LA, Certificate Number 0751.05, for all testing performed within the scope of this report. Testing was performed at the locations noted below.

	Address	ISED CABID	ISED Company Number	FCC Registration
$\boxtimes$	Building 1: 47173 Benicia Street,	US0104	2324A	208313
	Fremont, California, USA			
	Building 2: 47266 Benicia Street,	US0104	2324A	208313
	Fremont, California, USA			
	Building 4: 47658 Kato Rd, Fremont,	US0104	2324A	208313
	California, USA			

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# 6. DECISION RULES AND MEASUREMENT UNCERTAINTY

# 6.1. METROLOGICAL TRACEABILITY

All test and measuring equipment utilized to perform the tests documented in this report are calibrated on a regular basis, with a maximum time between calibrations of one year or the manufacturers' recommendation, whichever is less, and where applicable is traceable to recognized national standards.

# 6.2. DECISION RULES

The Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4:2012 Clause 8.2. (Measurement uncertainty is not taken into account when stating conformity with a specified requirement).

# 7. MODEL DIFFERENCES

The manufacturer hereby declares that:

- All models use the same system, cellular and Wi-Fi/BT radio electrical schematics.
- Removal of FR2 and LTE bands on models not supporting them is accomplished by depopulation of the related components. There are no electrical differences between the models..
- Ant 8, UWB0, UWB1 and UWB3 has different tuning between the models supporting FR2 and models not supporting FR2 bands.
- All models use the same Wi-Fi/BT chipset and radio module.
- All models use the same Applications Processor and PMU.
- All models use the same UICC hardware/software interface.
- All models run the same Baseband firmware and iOS software.

The characteristics listed above do not have any influence upon the DFS performance of the models covered by this report and therefore the DFS test results documented for Parent Model A2481 for may be applied as representative to Variant Models A2626, A2628, A2629 and A2630.

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# 8. DYNAMIC FREQUENCY SELECTION

# 8.1. OVERVIEW

## 8.1.1. LIMITS

#### INNOVATION, SCIENCE and ECONOMIC DEVELOPMENT CANADA (ISED)

ISED RSS-247 is closely harmonized with FCC Part 15 DFS rules. The deviations are as follows:

RSS-247 Issue 2

**Note:** For the band 5600–5650 MHz, no operation is permitted.

Until further notice, devices subject to this annex shall not be capable of transmitting in the band 5600–5650 MHz. This restriction is for the protection of Environment Canada weather radars operating in this band.

#### FCC

§15.407 (h), FCC KDB 905462 D02 "COMPLIANCE MEASUREMENT PROCEDURES FOR UNLICENSED-NATIONAL INFORMATION INFRASTRUCTURE DEVICES OPERATING IN THE 5250-5350 MHz AND 5470-5725 MHz BANDS INCORPORATING DYNAMIC FREQUENCY SELECTION" and KDB 905462 D03 "U-NII CLIENT DEVICES WITHOUT RADAR DETECTION CAPABILITY".

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# 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	Client	Client	
		(without DFS)	(with DFS)	
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	

Additional requirements for	Master Device or Client with	Client		
devices with multiple bandwidth modes	Radar DFS	(without DFS)		
		No.4 we we do a d		
U-NII Detection Bandwidth and	All BW modes must be	Not required		
Statistical Performance Check	tested			
Channel Move Time and Channel	Test using widest BW mode	Test using the		
Closing Transmission Time	available	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 all 20				
MHz channel blocks and a null frequency between the bonded 20 MHz channel blocks.				

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# Table 3: Interference Threshold values, Master or Client incorporating In-ServiceMonitoring

Monitoring				
Maximum Transmit Power	Value			
	(see notes)			
E.I.R.P. ≥ 200 milliwatt	-64 dBm			
E.I.R.P. < 200 milliwatt and	-62 dBm			
power spectral density < 10 dBm/MHz				
E.I.R.P. < 200 milliwatt that do not meet power spectral	-64 dBm			
density requirement				
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 three	shold level to trigger a DFS			
response.				
Note 3: E.I.R.P. is based on the highest antenna gain. For MIMO devices refer to KDB				
publication 662911 D01.				

Tuble 4. Di o Response requirement values	
Parameter	Value
Non-occupancy period	30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds (See Note 1)
Channel Closing Transmission Time	200 milliseconds + approx. 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)

## Table 4: DFS Response requirement values

**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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#### Table 5 – Short Pulse Radar Test Waveforms

		Pulse Radar Test wave		r	
Radar	Pulse	PRI	Pulses	Minimum	Minimum
Туре	Width	(usec)		Percentage	Trials
	(usec)			of Successful	
				Detection	
0	1	1428	18	See Note 1	See Note
					1
1	1	Test A: 15 unique		60%	30
		PRI values randomly			
		selected from the list	Roundup:		
		of 23 PRI values in	{(1/360) x (19 x 10 <sup>6</sup> PRI <sub>usec</sub> )}		
		table 5a			
		Test B: 15 unique			
		PRI values randomly			
		selected within the			
		range of 518-3066			
		usec. With a			
		minimum increment			
		of 1 usec, 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 T	ypes 1-4)	80%	120
		ulse Radar Type 0 shou Channel Closing Time to	Id be used for the <i>Detection Bar</i> ests.	ndwidth test, Ch	annel

Table 6 – Long Pulse Radar Test Signal

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

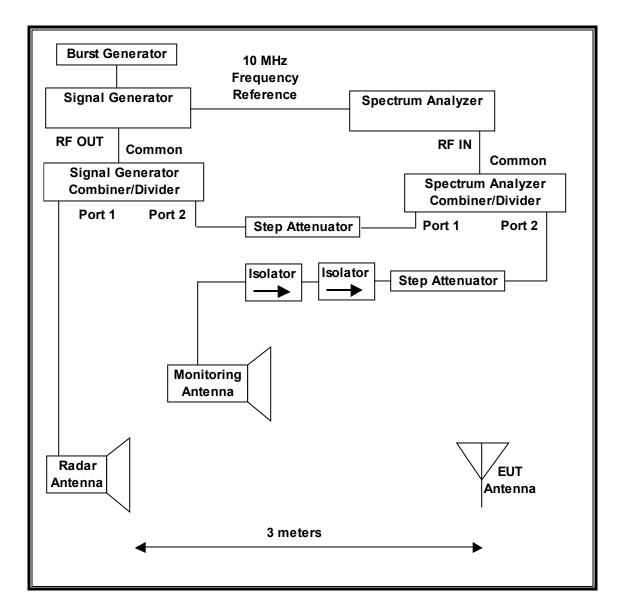
## Table 7 – Frequency Hopping Radar Test Signal

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

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# 8.1.2. TEST AND MEASUREMENT SYSTEM

#### RADIATED METHOD SYSTEM BLOCK DIAGRAM



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#### SYSTEM OVERVIEW

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

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

The hopping type 6 pulse parameters are fixed while the hopping sequence is based on the August 2005 NTIA Hopping Frequency List. The initial starting point randomized at run-time and each subsequent starting point is incremented by 475. Each frequency in the 100-length segment is compared to the boundaries of the EUT Detection Bandwidth and the software creates a hopping burst pattern in accordance with Section 7.4.1.3 Method #2 Simulated Frequency Hopping Radar Waveform Generating Subsystem of KDB 905462 D02. The frequency of the signal generator is incremented in 1 MHz steps from  $F_L$  to  $F_H$  for each successive trial. This incremental sequence is repeated as required to generate a minimum of 30 total trials and to maintain a uniform frequency distribution over the entire Detection Bandwidth.

The signal monitoring equipment consists of a spectrum analyzer. The aggregate ON time is calculated by multiplying the number of bins above a threshold during a particular observation period by the dwell time per bin, with the analyzer set to peak detection and max hold.

#### SYSTEM CALIBRATION

A 50-ohm load is connected in place of the spectrum analyzer, and the spectrum analyzer is connected to a horn antenna via a coaxial cable, with the reference level offset set to (horn antenna gain – coaxial cable loss). The signal generator is set to CW mode. The amplitude of the signal generator is adjusted to yield a level of –64 dBm as measured on the spectrum analyzer.

Without changing any of the instrument settings, the spectrum analyzer is reconnected to the Common port of the Spectrum Analyzer Combiner/Divider. The Reference Level Offset of the spectrum analyzer is adjusted so that the displayed amplitude of the signal is –64 dBm.

The spectrum analyzer displays the level of the signal generator as received at the antenna ports of the Master Device. The interference detection threshold may be varied from the calibrated value of –64 dBm and the spectrum analyzer will still indicate the level as received by the Master Device.

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#### ADJUSTMENT OF DISPLAYED TRAFFIC LEVEL

A link is established between the Master and Slave and the distance between the units is adjusted as needed to provide a suitable received level at the Master and Slave devices. The video test file is streamed to generate WLAN traffic. The monitoring antenna is adjusted so that the WLAN traffic level, as displayed on the spectrum analyzer, is at lower amplitude than the radar detection threshold.

#### TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST							
Description	Manufacturer	Model	ID No.	Cal Due			
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight	N9030A	T1634	02/24/22			
Signal Generator, MXG X-Series RF Vector	Agilent	N5182B	T1633	01/26/22			

## 8.1.3. TEST AND MEASUREMENT SOFTWARE

The following test and measurement software was utilized for the tests documented in this report:

TEST SOFTWARE LIST					
Name Version Test / Function					
Aggregate Time-PXA	3.1	Channel Loading and Aggregate Closing Time			
PXA Read	3.1	Signal Generator Screen Capture			
SGXProject.exe	1.7	Radar Waveform Generation and Download			

## 8.1.4. TEST ROOM ENVIRONMENT

The test room temperature and humidity shall be maintained within normal temperature of 15~35 °C and normal humidity 20~75% (relative humidity).

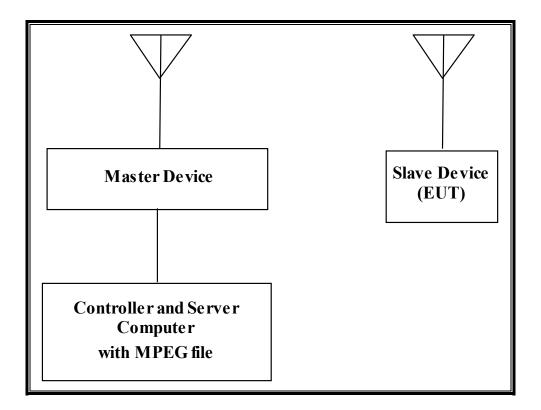
#### **ENVIRONMENT CONDITION**

Parameter	Value
Temperature	24.7 and 25.1 °C
Humidity	35 and 37 %

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# 8.1.5. SETUP OF EUT (CLIENT MODE)

#### RADIATED METHOD EUT TEST SETUP



#### SUPPORT EQUIPMENT

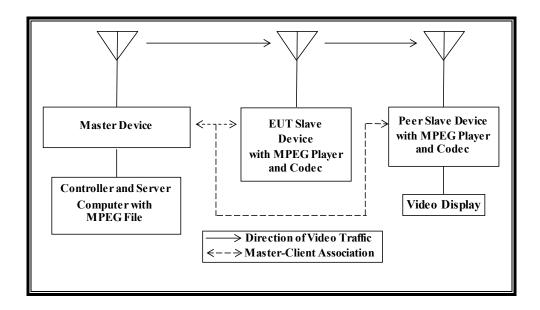
The following support equipment was utilized for the tests documented in this report:

PERIPHERAL SUPPORT EQUIPMENT LIST							
Description	Manufacturer	Model	Serial Number	FCC ID			
802.11a/b/g/n/ac Wireless Router (Master Device)	Apple	A1521	C86PJ5RUFJ1R	BCGA1521			
Notebook PC (Controller/Server)	Apple	A1708	C02VQ6D6HV27	DoC			
AC Adapter (Notebook PC)	Apple	A1718	1PGQC000089	DoC			

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## 8.1.6. SETUP OF EUT (CLIENT TO CLIENT MODE)

# RADIATED METHOD EUT TEST SETUP WHEN MONITORING THE EUT



#### SUPPORT EQUIPMENT

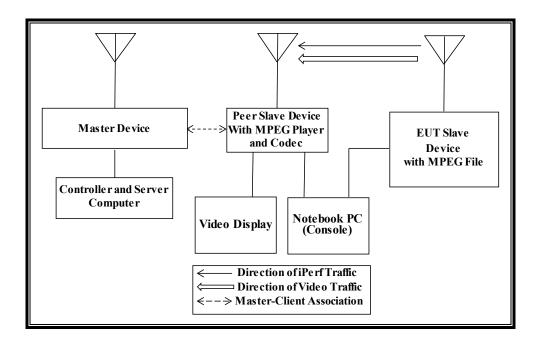
The following support equipment was utilized for the tests documented in this report:

PERIPHERAL SUPPORT EQUIPMENT LIST							
Description	Manufacturer	Model	Serial Number	FCC ID			
802.11a/b/g/n/ac Wireless	Apple	A1521	C86PJ5RUFJ1R	BCGA1521			
Router (Master Device)							
Notebook PC	Apple	A1708	C02VQ6D6HV27	DoC			
(Controller/Server)							
AC Adapter (Notebook PC)	Apple	A1718	1PGQC000089	DoC			
Apple TV (Peer Slave Device)	Apple	A1842	DY3ZM2D5J1WF	BCGA1842			
15" LCD TV (Video Display)	Polaroid	TLX-01511C	02006	DoC			

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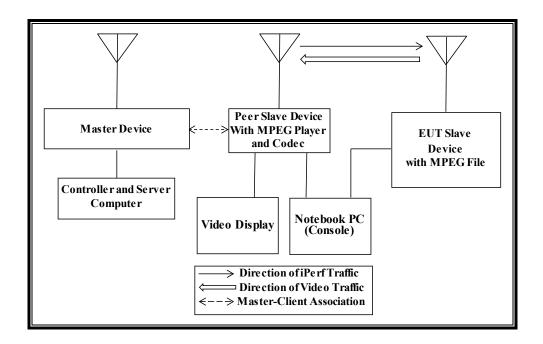
# 8.1.7. SETUP OF EUT (PEER TO PEER MODE)

#### RADIATED METHOD EUT TEST SETUP WHEN MONITORING THE EUT



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#### RADIATED METHOD EUT TEST SETUP WHEN MONITORING THE PEER SLAVE DEVICE)



#### SUPPORT EQUIPMENT

The following support equipment was utilized for the tests documented in this report:

PERIPHERAL SUPPORT EQUIPMENT LIST						
Description	Manufacturer	Manufacturer Model		FCC ID		
802.11a/b/g/n/ac Wireless Router (Master Device)	Apple	A1521	C86PJ5RUFJ1R	BCGA1521		
Notebook PC (Controller/Server)	Apple	A1708	C02VQ6D6HV27	DoC		
AC Adapter (Notebook PC)	Apple	A1718	1PGQC000089	DoC		
Apple TV (Peer Slave Device)	Apple	A1842	DY3ZM2D5J1WF	BCGA1842		
Notebook PC (Peer Console)	Apple	A1708	C02VT5DTHV22	DoC		
15" LCD TV (Video Display)	Polaroid	TLX-01511C	02006	DoC		

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# 8.1.8. DESCRIPTION OF EUT

For FCC the EUT operates over the 5250-5350 MHz and 5470-5725 MHz ranges.

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

The EUT is a Slave Device without Radar Detection.

Slave EUT EIRP, maximum conducted output power, antenna assembly gain and TPC information can be found in the RF report referenced in section 4 of this report.

Two antennas are utilized to meet the diversity and MIMO operational requirements.

The rated output power of the Master unit is > 23dBm (EIRP). Therefore the required interference threshold level is -64 dBm. After correction for procedural adjustments, the required radiated threshold at the antenna port is -64 + 1 = -63 dBm.

The calibrated radiated DFS Detection Threshold level is set to –64 dBm. The tested level is lower than the required level hence it provides a margin to the limit.

The EUT uses two transmitter/receiver chains, each connected to an antenna to perform radiated tests.

In **Standard Client Mode** WLAN traffic that meets or exceeds the minimum required loading was generated by streaming the compressed version of the video test file "6 ½ Magic Hours" from the Master to the Slave using OPlayer media player.

In **Client to Client mode** WLAN traffic is generated by streaming the compressed version of the video test file "6 ½ Magic Hours" from the Master to the Slave and then on to the peer slave device in full motion video mode using OPlayer media player and embedded proprietary AirPlay software.

In **Peer to Peer mode while monitoring the EUT**, WLAN traffic is generated with the combination of streaming the compressed version of the video test file "6 ½ Magic Hours" from the EUT to the Peer Slave Device in full motion video mode using OPlayer media player and embedded proprietary AirPlay software and Iperf from the EUT to the Peer Slave Device.

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In **Peer to Peer mode while monitoring the Peer Slave Device**, WLAN traffic is generated with the combination of streaming the compressed version of the video test file "6 ½ Magic Hours" from the EUT to the Peer Slave Device in full motion video mode using OPlayer media player and embedded proprietary AirPlay software and Iperf from the Peer Slave Device to the EUT.

While performing **Peer to Peer Mode** testing only the Peer Slave Device is associated to the Master Device.

Peer to Peer Mode has been reviewed and approved as compliant with the DFS requirements for client devices by the FCC via KDB inquiry. The inquiry confirmed that the test cases used adequately demonstrate compliance with DFS requirements for client devices.

The EUT utilizes the 802.11a/b/g/n/ac/ax architecture. Three nominal channel bandwidths are implemented: 20 MHz, 40 MHz and 80 MHz.

The manufacturer declares that Channel Puncturing is not supported.

The software installed in the EUT is 15.0 (19A245a).

The software installed in the access point is revision 7.7.9.

#### UNIFORM CHANNEL SPREADING

This function is not required per KDB 905462.

#### **OVERVIEW OF MASTER DEVICE WITH RESPECT TO §15.407 (h) REQUIREMENTS**

The Master Device is an Apple, Inc. Access Point, FCC ID: BCGA1521. The minimum antenna gain for the Master Device is 1.4 dBi.

The rated output power of the Master unit is > 23dBm (EIRP). Therefore the required interference threshold level is -64 dBm. After correction for procedural adjustments, the required radiated threshold at the antenna port is -64 + 1 = -63 dBm.

The calibrated radiated DFS Detection Threshold level is set to –64 dBm. The tested level is lower than the required level hence it provides a margin to the limit.

The software installed in the access point is revision 7.7.9.

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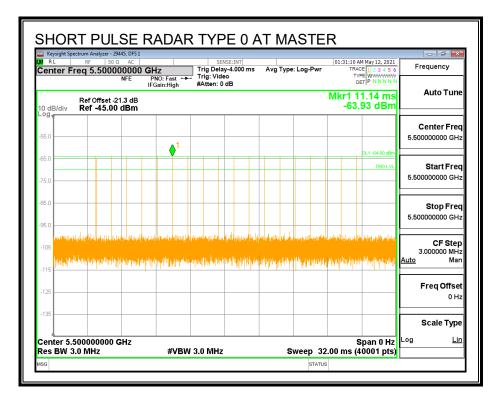
# 8.2. CLIENT MODE RESULTS FOR 20 MHz BANDWIDTH

# 8.2.1. TEST CHANNEL

All tests were performed at a channel center frequency of 5500 MHz.

# 8.2.2. RADAR WAVEFORM AND TRAFFIC

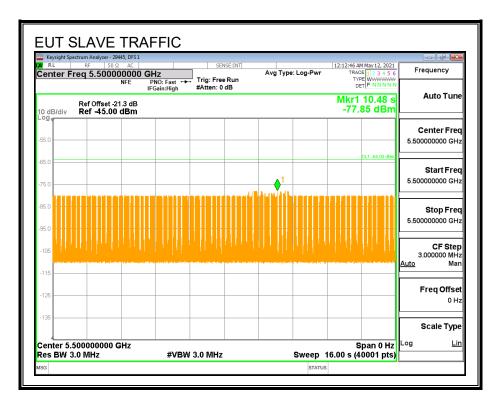
## RADAR WAVEFORM



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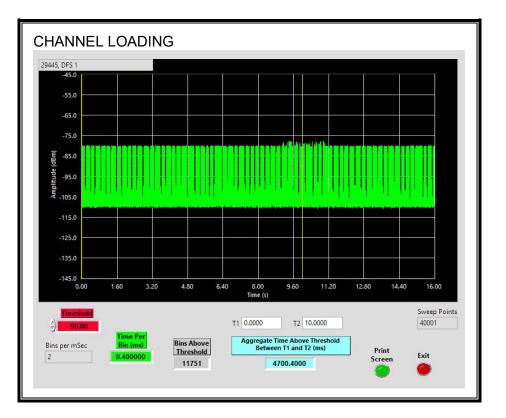
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#### **TRAFFIC**



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#### **CHANNEL LOADING**



The level of traffic loading on the channel by the EUT is 47.0%

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# 8.2.3. OVERLAPPING CHANNEL TESTS

#### **RESULTS**

These tests are not applicable.

# 8.2.4. MOVE AND CLOSING TIME

#### **REPORTING NOTES**

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

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

The aggregate channel closing transmission time is calculated as follows:

Aggregate Transmission Time = (Number of analyzer bins showing transmission) \* (dwell time per bin)

The observation period over which the aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

#### <u>RESULTS</u>

Channel Move Time	Limit
(sec)	(sec)
0.0988	10

Aggregate Channel Closing Transmission Time	Limit
(msec)	(msec)
0.0	60

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#### MOVE TIME

RL	R		AC		SENS	E:INT			M May 12, 2021	Frequency
enter	Freq			Z IO:Fast ⊶ ain:High	Trig: Free #	Run	vg Type: Log-Pwr	TYP	E 1 2 3 4 5 6 E WWWWWW T P N N N N N	
0 dB/div		f Offset -21 f -45.00		5			4	∆Mkr1 9 -1	8.80 ms 5.47 dB	Auto Tune
og										Center Free
55.0									DL1 -64.00 dBm	5.500000000 GH:
85.0										Start Free
95.0 •105		htels[]-state	titulaandanti	nhouedda	h dhalan ta heryada	pasadatapada	Hadroweigelagel	ina phain	n farmalar	5.50000000 GH
115										Stop Free
125										5.50000000 GH
enter : es BW		000000 G	iHz	#VB)	N 3.0 MHz		Sween	S 16.00 s (4	pan 0 Hz	CF Step 3.000000 MH
IKR MODE	TRC SC	L	x		Y	FUNCTION	•			Auto Mar
1 Δ2 2 F 3	$\frac{1}{1}$ t	(Δ)		80 ms (Δ) .635 s	-15.47 d -64.60 dBi					Freq Offse
4 5 6									Ξ	0 H:
7 8 9										Scale Type
10 11										Log <u>Lir</u>

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#### **CHANNEL CLOSING TIME**

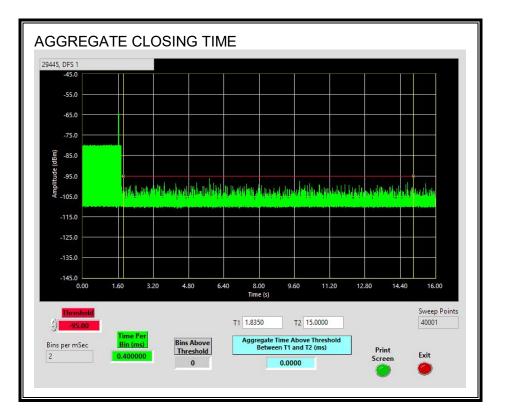
Keysight Spectrum Analyzer - 29445, DFS 1           RL         RF         50 Ω         AC           enter Freq 5.500000000         G	SENSE:INT	Avg Type: Log-Pwr	12:21:25 AM May 12, 2021 TRACE 1 2 3 4 5 6	Frequency		
NFE	PNO: Fast +++ Trig: Video FGain:High #Atten: 0 dB			Auto Tune		
Ref Offset -21.3 dB dB/div Ref -45.00 dBm	B/div Ref -45.00 dBm -37.31 dB					
5.0				Center Free 5.500000000 GH		
5.0			DL1 -64.00 dBm	0.0000000000		
5.0			TRIG LVL	<b>Start Fred</b> 5.500000000 GH		
5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0				<b>Stop Free</b> 5.50000000 GH		
			ni sa katalong pilanaki ni sana tang silati sa kata	CF Step 3.000000 MH Auto Mar		
125				Freq Offse 0 H		
35				Scale Type		
enter 5.500000000 GHz es BW 3.0 MHz	#VBW 3.0 MHz		Span 0 Hz .0 ms (40001 pts)	Log <u>Lir</u>		

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#### AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

No transmissions are observed during the aggregate monitoring period.



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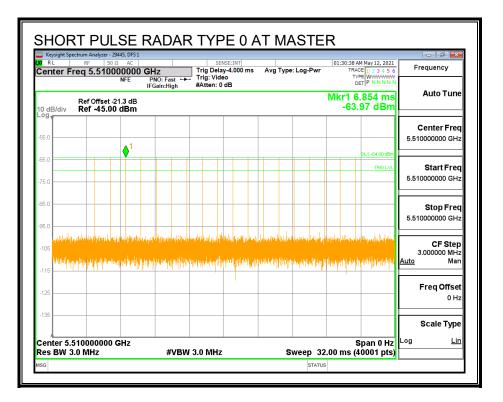
# 8.3. CLIENT MODE RESULTS FOR 40 MHz BANDWIDTH

# 8.3.1. TEST CHANNEL

All tests were performed at a channel center frequency of 5510 MHz.

# • RADAR WAVEFORM AND TRAFFIC

#### RADAR WAVEFORM



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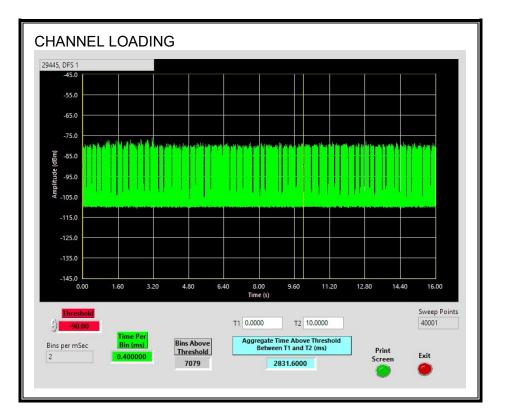
#### **TRAFFIC**

Keysight Spectrum Analyzer - 29445, DFS 1 RL RF 50 Ω AC	SENSE:INT		12:23:41 AM May 12, 2021	- 8 -		
enter Freq 5.51000000 (		Avg Type: Log-Pwr	TRACE 1 2 3 4 5 6 TYPE WWWWWW DET P N N N N N	Frequency Auto Tune		
Ref Offset -21.3 dB dB/div Ref -45.00 dBm						
pg -				Center Free		
5.0			DL1 -64.00 dBm	5.510000000 GH		
5.0				Start Free 5.510000000 GH:		
ן ער איז	i dagi sarifikli pilipang kalensi pong kana fitikan			<b>Stop Frec</b> 5.510000000 GH;		
			all in definition.	<b>CF Step</b> 3.000000 MH: <u>Auto</u> Mar		
115						
25				Freq Offse 0 Ha		
35				Scale Type		
enter 5.510000000 GHz es BW 3.0 MHz	#VBW 3.0 MHz	Swoon	Span 0 Hz 16.00 s (40001 pts)	Log <u>Lir</u>		

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#### **CHANNEL LOADING**



The level of traffic loading on the channel by the EUT is 28.31%

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# 8.3.2. OVERLAPPING CHANNEL TESTS

#### **RESULTS**

These tests are not applicable.

# 8.3.3. MOVE AND CLOSING TIME

#### **REPORTING NOTES**

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

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

The aggregate channel closing transmission time is calculated as follows:

Aggregate Transmission Time = (Number of analyzer bins showing transmission) \* (dwell time per bin)

The observation period over which the aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

#### <u>RESULTS</u>

Channel Move Time	Limit
(sec)	(sec)
0.1104	10

Aggregate Channel Closing Transmission Time	Limit
(msec)	(msec)
0.0	60

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#### MOVE TIME

enter Fre		DFS 1 AC	SEN	SE:INT		12:27:10 AM N		Frequency
	eq 5.510000	E PNO: Fas		Run	rg Type: Log-Pwr	TYPE	1 2 3 4 5 6 WWWWWWW P NNNNN	rrequency
	Ref Offset -21.3		h #Atten: 00		۵	Mkr1 11	).4 ms	Auto Tune
0 dB/div og	Ref -45.00 dl	3m				-17.	87 dB	
56.0	×2					D.	1 -64.00 dBm	Center Fred 5.510000000 GH;
75.0 85.0	1Δ2							Start Fred
95.0 -105	Hepathheatiley	the design of the second	htterneter for the state of the	Nanotsawthawlla	minandanaktik	nilos bandela	ha Manan ya Ma	5.510000000 GHz
115								Stop Fred
125								5.510000000 GH
135							I	
enter 5.5 Bes BW 3.0	10000000 GH 0 MHz		/BW 3.0 MHz		Sweep	Sp 16.00 s (40		CF Step 3.000000 MHz
enter 5.5 es BW 3.0	0 MHz	#\	Y	FUNCTION	Sweep		001 pts)	
Center 5.5 Ces BW 3.0 IKR MODE TRO 1 A2 1 2 F 1 3	0 MHz	#\	Y	IB	•	16.00 s (40	001 pts)	3.000000 MH Auto Mar Freq Offse
center 5.5 ces BW 3.0 CR MODE TRO 1 Δ2 1 2 F 1 3 4 5 6	0 MHz SCL	#\ x 110.4 ms	Υ (Δ) -17.87 c	IB	•	16.00 s (40	001 pts)	3.000000 MH Auto Mar Freq Offse
Center 5.5 Ces BW 3.0 IKR MODE TRC 1 A2 1 2 F 1 3 4	0 MHz SCL	#\ x 110.4 ms	Υ (Δ) -17.87 c	IB	•	16.00 s (40	001 pts)	3.000000 MH

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#### **CHANNEL CLOSING TIME**

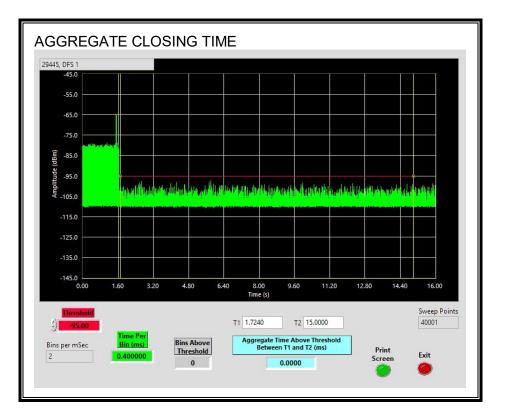
RL RF 50 Ω	AC	SENSE:INT		12:32:48 AM May 12, 2021	_ 6
enter Freq 5.51000			Avg Type: Log-Pwr	TRACE 1 2 3 4 5 6 TYPE WWWWWWW DET P N N N N N	Frequency
Ref Offset -21	.3 dB		ΔΝ	/kr1 200.0 ms -39.06 dB	Auto Tune
g					Center Free
5.0					5.510000000 GH
5.0				DL1 -64.00 dBm	
5.0				TRIG LVL	Start Free 5.510000000 GH
5.0					<b>Stop Free</b> 5.510000000 GH
05 And Physics of the Astley	an harrow dipantané. Kapitané kané na k			an and a construction of the first second starting	CF Step 3.000000 MH <u>Auto</u> Mar
25					Freq Offse
35					Scale Type
				Span 0 Hz	Log <u>Lin</u>

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#### AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

No transmissions are observed during the aggregate monitoring period.



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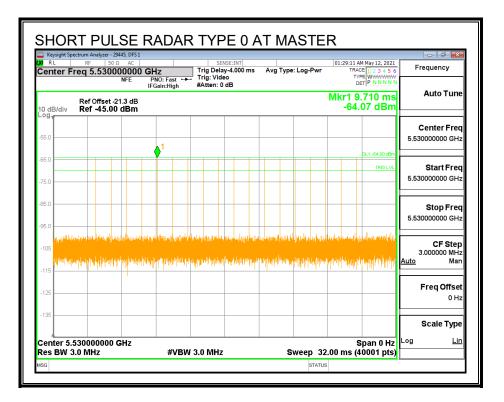
# 8.4. CLIENT MODE RESULTS FOR 80 MHz BANDWIDTH

# 8.4.1. TEST CHANNEL

All tests were performed at a channel center frequency of 5530 MHz.

# • RADAR WAVEFORM AND TRAFFIC

## RADAR WAVEFORM



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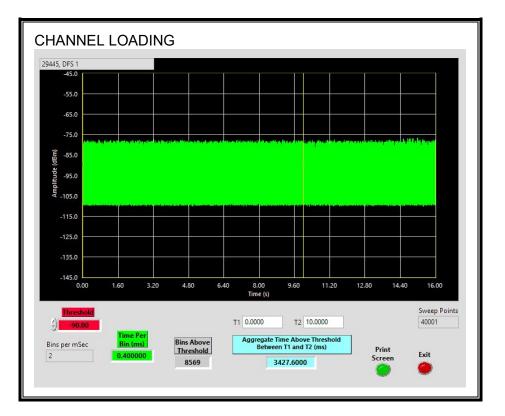
#### **TRAFFIC**

	50 Ω AC		SENSE:INT		12:34:37 AM May 12, 2021	
enter Freq 5.5	NFE P	NO: East	Trig: Free Run #Atten: 0 dB	Avg Type: Log-Pwr	TRACE 1 2 3 4 5 6 TYPE WWWWWW DET P N N N N N	Frequency
dB/div Ref -4	set -21.3 dB 5.00 dBm				Mkr1 15.20 s -76.64 dBm	Auto Tune
pg						Center Fred
5.0					DL1 -64.00 dBm	5.530000000 GHz
5.0	Justa dashira basaran bir		an all language and set language and set of set	ay in a constant of the consta	1	Start Fred 5.530000000 GHz
5.0						<b>Stop Fred</b> 5.530000000 GHz
5.0						
105		e el journe en e	hter ber filmen i ja mit der in die erfektio		y any sector of the last of the sector of th	3.000000 MHz
						3.000000 MHz <u>Auto</u> Mar
15						CF Step 3.00000 MHz Auto Mar Freq Offset 0 Hz
105						3.000000 MHz <u>Auto</u> Mar Freq Offset

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## **CHANNEL LOADING**



The level of traffic loading on the channel by the EUT is 34.27%

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# 8.4.2. OVERLAPPING CHANNEL TESTS

#### **RESULTS**

These tests are not applicable.

# 8.4.3. MOVE AND CLOSING TIME

## **REPORTING NOTES**

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

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

The aggregate channel closing transmission time is calculated as follows:

Aggregate Transmission Time = (Number of analyzer bins showing transmission) \* (dwell time per bin)

The observation period over which the aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

#### <u>RESULTS</u>

Channel Move Time	Limit
(sec)	(sec)
0.1424	10

Aggregate Channel Closing Transmission Time	Limit
(msec)	(msec)
0.0	60

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#### MOVE TIME

	m Analyzer - 29445, DFS 1 RF 50 Ω AC		SENSE:INT		12:38:1	1 AM May 12, 2021	
enter Fred	7 5.53000000 NFE	PNO: Fast ↔	, Trig: Free Run #Atten: 0 dB	Avg Type: Lo	g-Pwr TF	ACE 1 2 3 4 5 6 TYPE WWWWWWWW DET P NNNNN	Frequency
	tef Offset -21.3 dB tef - <b>45.00 dBm</b>		#Atten: 0 db			142.4 ms 16.84 dB	Auto Tune
og							Center Fred
55.0	<sup>2</sup> 1∆2					DL1 -64.00 dBm	5.53000000 GH:
95.0 105	Liteland Alder	and to all test and the still		laga fata fa atta sa dita ba hiji	(make a substitution biblicity)	1)teidendekodik.	Start Free 5.530000000 GH;
115							
125							Stop Fred 5.530000000 GH;
es BW 3.0	SCL X				/eep 16.00 s		CF Step 3.000000 MH: Auto Mar
2 F 1 3 4 5	t (Δ) t	142.4 ms (Δ) 1.562 s	-16.84 dB -64.94 dBm			E	Freq Offset 0 Hz
6 7							Scale Type
7 8 9							

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## **CHANNEL CLOSING TIME**

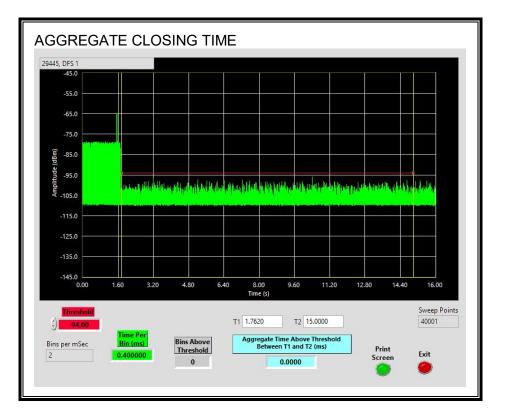
Keysight Spectrum Analyzer - 2	9445, DFS 1 Ω AC	SENSE:INT		2:41:43 AM May 12, 2021	
enter Freq 5.5300			Avg Type: Log-Pwr	TRACE 1 2 3 4 5 6 TYPE WWWWWW DET P NNNNN	Frequency
Ref Offset - dB/div <b>Ref -45.0</b> 0	21.3 dB	Writen o do	ΔΜ	kr1 200.0 ms -39.68 dB	Auto Tune
g					Center Free
5.0				DL1 -64.00 dBm	5.530000000 GH
5.0 2				TRIG LVL	Start Free 5.530000000 GH
5.0					<b>Stop Fred</b> 5.530000000 GH:
			ar huttepison antis fait thearen even deal on a construction of a second second second second second	a production of the state of the second	CF Step 3.000000 MH: Auto Mar
25					Freq Offse 0 Hi
35					Scale Type
enter 5.530000000 es BW 3.0 MHz		SW 3.0 MHz	0	Span 0 Hz ) ms (40001 pts)	_og <u>Lir</u>

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## AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

No transmissions are observed during the aggregate monitoring period.



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# 8.4.4. 30-MINUTE NON-OCCUPANCY PERIOD

#### **RESULTS**

No EUT transmissions were observed on the test channel during the 30-minute observation time.

Key:		um Analyzer - 29 RF 50 S		_	SE1	NSE:INT			01-25-27 4	M May 12, 2021		ə X
		q 5.5300	00000 GH	lz NO: Fast ↔	Trig: Free	e Run	Avg Type	: Log-Pwr	TRAC	DE 1 2 3 4 5 6 PE WWWWWWW	Frequen	cy
0 dB		Ref Offset -2 Ref -45.00	1.3 dB	Gain:High	#Atten: 0	dB			ΔMkr1 1	1.800 ks 0.04 dB	Auto	Tune
.og 55.0											Cente 5.5300000	
65.0 75.0	2									DL1 -64.00 dBm	<b>Star</b> 5.5300000	tFrec D0 GH:
35.0 - 35.0 -	IW W2			1							<b>Stor</b> 5.5300000	o Frec DO GH:
105 -	pyllelli	ka papalaka ny	p-duampla	lippen in	/Hillighter vije	ydenddiger	hi daya ka	of Wildelin			CF 3.00000 Auto	<b>Step</b> 00 MHz Mar
125 -											Freq	Offse 0 H;
135 -											Scale	туре
ent	er 5.53	0000000	GHz						S	span 0 Hz	Log	Lir

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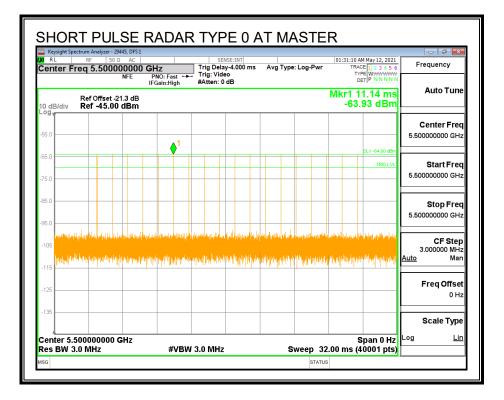
# 8.5. CLIENT-TO-CLIENT COMMUNICATIONS MODE RESULTS FOR 20 MHz BANDWIDTH

# 8.5.1. TEST CHANNEL

All tests were performed at a channel center frequency of 5500 MHz.

# 8.5.2. RADAR WAVEFORM AND TRAFFIC

## RADAR WAVEFORM



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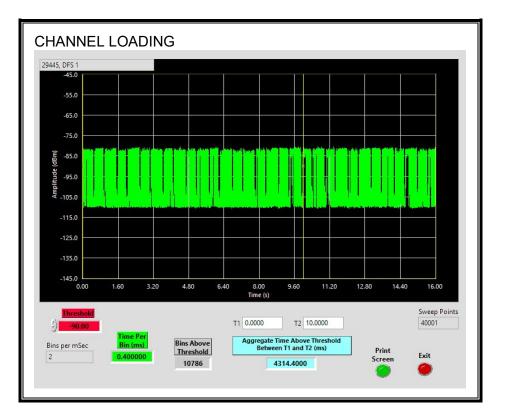
#### **TRAFFIC**

Keysight Spectrum Analyz R L RF	50 Ω AC	SENSE:INT		01:55:03 AM May 12, 2021	Frequency
enter Freq 5.50		Fast ↔ Trig: Free Run :High #Atten: 0 dB	Avg Type: Log-Pwr	TRACE 1 2 3 4 5 6 TYPE WWWWWW DET P N N N N N	Frequency
) dB/div Ref -4	set -21.3 dB 5.00 dBm			Mkr1 6.043 s -80.34 dBm	Auto Tune
og					Center Free
5.0				DL1 -64.00 dBm	5.500000000 GH;
5.0					Start Free
5.0					5.500000000 GH;
5.0					<b>Stop Frec</b> 5.50000000 GH
105					CF Step 3.000000 MH: Auto Mar
115					<u>Auto</u> Mar
125					Freq Offse 0 H;
135					Scale Type
enter 5.5000000 es BW 3.0 MHz	00 GHz	#VBW 3.0 MHz		Span 0 Hz 16.00 s (40001 pts)	Log <u>Lir</u>

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## **CHANNEL LOADING**



The level of traffic loading on the channel by the EUT is 43.14%

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# **8.5.3. OVERLAPPING CHANNEL TESTS**

#### **RESULTS**

These tests are not applicable.

# 8.5.4. MOVE AND CLOSING TIME

## **REPORTING NOTES**

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

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

The aggregate channel closing transmission time is calculated as follows:

Aggregate Transmission Time = (Number of analyzer bins showing transmission) \* (dwell time per bin)

The observation period over which the aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

#### <u>RESULTS</u>

Channel Move Time	Limit
(sec)	(sec)
0.138	10

Aggregate Channel Closing Transmission Time	Limit
(msec)	(msec)
0.0	60

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#### MOVE TIME

RL	m Analyzer - 29445, DFS RF 50 Ω AC		SENSE:INT			02:01:28 AM May 12, 20	21 _
enter Fred	5.50000000 NFE	PNO: Fast ↔	∴ Trig: Free Run #Atten: 0 dB	Avg Ty	pe: Log-Pwr	TRACE 1 2 3 4 5 TYPE WWWWW DET P N N N	ww
	ef Offset -21.3 dB ef -45.00 dBm		#Atten: 0 dB		Δ	Mkr1 138.0 m -15.20 d	s Auto Tune
.og							
55.0	142					DL1 -64.00 dB	Center Fred 5.500000000 GH:
95.0 <b>+</b>	n trick Allocathe mines a	la become el tra territa i al.	and a second	tilis ac citianta	na lila la kanaika na	k an hiden the chiracteristics de	Start Fred 5.500000000 GH2
105							
125							<b>Stop Fred</b> 5.500000000 GH2
enter 5.500 es BW 3.0		#VBV	V 3.0 MHz	UNCTION	Sweep 1	Span 0 H 6.00 s (40001 pt EUNCTION VALUE	
<b>1</b> Δ2 1	t (Δ) t	138.0 ms (Δ) 1.658 s		ONCTION	UNCTION WIDTH	PONCTION VALUE	<b>^</b>
3 4 5		1.008 \$	-04.00 UBIII				Freq Offse
6 7							Scale Type
8							

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## **CHANNEL CLOSING TIME**

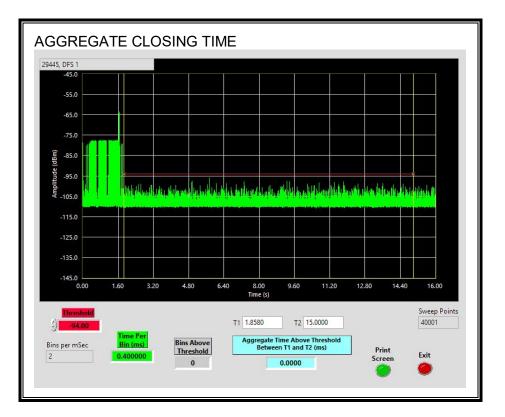
	er - 29445, DFS 1 50 Ω AC	SENSE:INT		02:08:53 AM May 12, 2021	Frequency
enter Freq 5.50	0000000 GHz NFE PNO: Fast ← IFGain:High	Trig: Video #Atten: 0 dB	Avg Type: Log-Pwr	TRACE 1 2 3 4 5 6 TYPE WWWWWW DET P N N N N N	Frequency
dB/div Ref -45	et -21.3 dB .00 dBm		ΔΝ	lkr1 200.0 ms -37.23 dB	Auto Tune
pg.					Center Fre
5.0				DL1 -64.00 dBm	5.500000000 GH
5.0 2				TRIG LVL	Start Free 5.50000000 GH
5.0				I	Stop Free
105			al hand di hatan hara shekara di sana sa	errine i serelika pina istica secolar	CF Step 3.000000 MH
115					<u>Auto</u> Ma
125					Freq Offse 0 H
35					Scale Type

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## AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

No transmissions are observed during the aggregate monitoring period.



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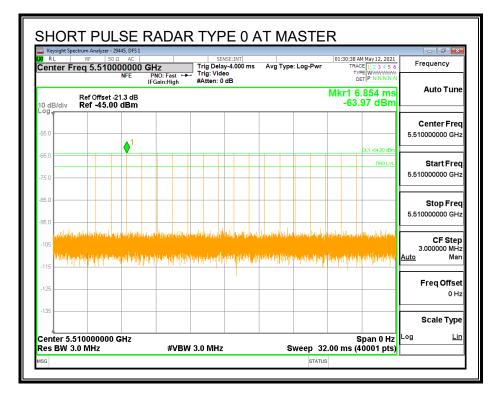
# 8.6. CLIENT-TO-CLIENT COMMUNICATIONS MODE RESULTS FOR 40 MHz BANDWIDTH

# 8.6.1. TEST CHANNEL

All tests were performed at a channel center frequency of 5510 MHz.

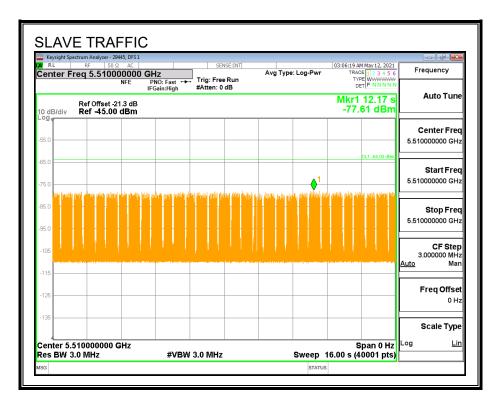
# 8.6.2. RADAR WAVEFORM AND TRAFFIC

## RADAR WAVEFORM



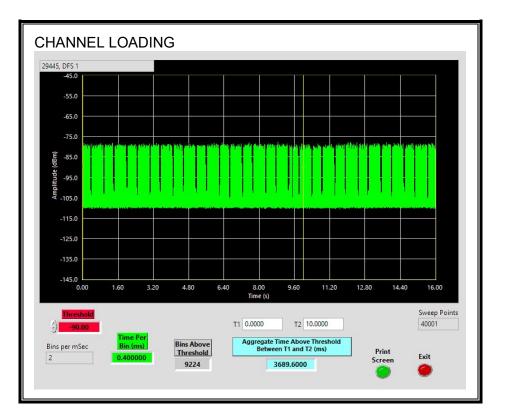
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#### **TRAFFIC**



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## **CHANNEL LOADING**



The level of traffic loading on the channel by the EUT is 36.89%

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# 8.6.3. OVERLAPPING CHANNEL TESTS

#### **RESULTS**

These tests are not applicable.

# 8.6.4. MOVE AND CLOSING TIME

## **REPORTING NOTES**

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

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

The aggregate channel closing transmission time is calculated as follows:

Aggregate Transmission Time = (Number of analyzer bins showing transmission) \* (dwell time per bin)

The observation period over which the aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

#### <u>RESULTS</u>

Channel Move Time	Limit
(sec)	(sec)
4.151	10

Aggregate Channel Closing Transmission Time	Limit
(msec)	(msec)
0.40	60

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#### MOVE TIME

RL RF	50 Ω AC	SENSE:INT		03:12:48 AM May 12, 2021	- 5 🐱
	510000000 GHz		Avg Type: Log-Pwr	TRACE 1 2 3 4 5 6	Frequency
	NFE PNO: Fa IFGain:Hi			DET P NNNN	Auto Tune
	ffset -21.3 dB -45.00 dBm			ΔMkr1 4.151 s -25.89 dB	Auto Tune
<b>og</b>					Center Free
65.0 <b>X</b> 7				DL1 -64.00 dBm	5.510000000 GH
75.0					
85.0		<sup>1∆2</sup>			Start Fred
95.0	والماري والموالية المراجع والمراجع والمراجع والمراجع	la ana ata tatan India tatan kata kata	al tella til a la contra contra contra data	a made a tax monthly a deal	5.51000000 GHz
115					
-125					Stop Fred 5.51000000 GHz
135					5.510000000 GH:
enter 5.51000	0000 GHz			Span 0 Hz	CF Ster
	7 #	VBW 3.0 MHz	Sweep	16.00 s (40001 pts)	3.000000 MH Auto Mar
tes BW 3.0 MH	- #				
	× Δ) 4.151 s		FUNCTION FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Mar
es BW 3.0 MH	×		FUNCTION FUNCTION WIDTH		Freq Offse
es BW 3.0 MH $\frac{1}{2}$ $\Delta 2$ 1 t ( 2 F 1 t 3 4 5	× Δ) 4.151 s		FUNCTION FUNCTION WIDTH	FUNCTION VALUE	
Res         BW         3.0 MH           1         Δ2         1         t         (	× Δ) 4.151 s		FUNCTION FUNCTION WIDTH		Freq Offse 0 H
Res         BW         3.0 MH           1         Δ2         1         t         ()           1         Δ2         1         t         ()           2         F         1         t         3           4         5         6         6	× Δ) 4.151 s		FUNCTION FUNCTION WIDTH	FUNCTION VALUE	Freq Offse

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## **CHANNEL CLOSING TIME**

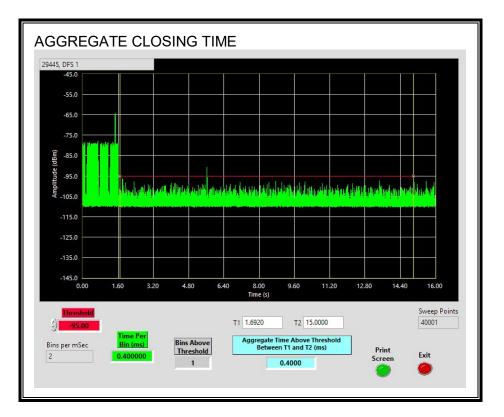
Keysight Spectrum Analyzer - 29445, DFS 1           RL         RF         50 Ω         AC	SENSE:INT		03:16:27 AM May 12, 2021	- # <b>*</b>
enter Freq 5.51000000 G		Avg Type: Log-Pwr	TRACE 1 2 3 4 5 6 TYPE WWWWWW DET P N N N N N	Frequency
Ref Offset -21.3 dB dB/div Ref -45.00 dBm	Gamingi witten oʻtib	ΔN	lkr1 200.0 ms -38.91 dB	Auto Tune
pg.				Center Free
5.0			DL1 -64.00 dBm	5.510000000 GH
5.0 2 5.0			TRIG LVL	Start Free 5.510000000 GH:
5.0				<b>Stop Free</b> 5.510000000 GH:
	halten also 122, bould die been bard die	nan paraity aliya kina bila ana ang manang paraity aliya. Nang mang sang sang sang sang sang sang sang s	a second of particulations	CF Step 3.000000 MH Auto Mar
25				Freq Offse 0 H
35				Scale Type
enter 5.510000000 GHz es BW 3.0 MHz			Span 0 Hz 0 ms (40001 pts)	Log <u>Lii</u>

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## AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

Only intermittent transmissions are observed during the aggregate monitoring period.



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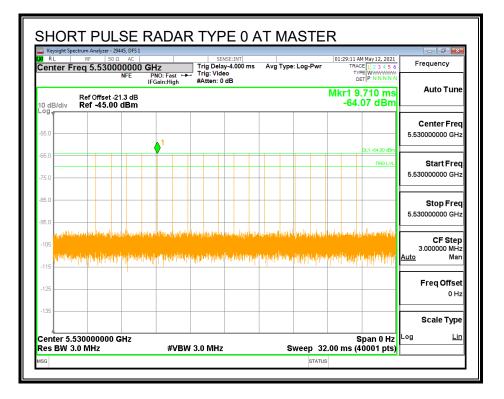
# 8.7. CLIENT-TO-CLIENT COMMUNICATIONS MODE RESULTS FOR 80 MHz BANDWIDTH

# 8.7.1. TEST CHANNEL

All tests were performed at a channel center frequency of 5530 MHz.

# 8.7.2. RADAR WAVEFORM AND TRAFFIC

## RADAR WAVEFORM



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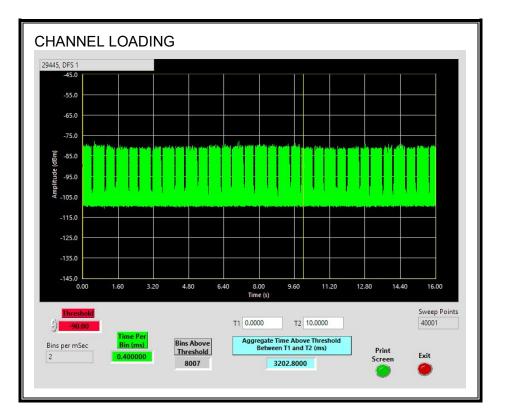
#### **TRAFFIC**

Keysight Spectrum Anal	50 Ω AC		SEN	ISE:INT		: Log-Pwr	03:22:36 AN	May 12, 2021	Frequency
enter Freq 5.3	NFE	ĦZ PNO: Fast ↔ •Gain:High	Trig: Free #Atten: 0		Avg Type	. Log-r wi	TYP		
) dB/div Ref -4	fset -21.3 dB 15.00 dBm							7.096 s 64 dBm	Auto Tune
pg									Center Free
5.0									5.530000000 GH
5.0			<b>●</b> <sup>1</sup>					DL1 -64.00 dBm	Start Fred 5.530000000 GH;
5.0	nes of each shall a first of factor			h Mandha provedo 		ril, les is weißt e			<b>Stop Frec</b> 5.53000000 GH;
105									CF Step 3.000000 MHz Auto Mar
115									
125									Freq Offse 0 Hi
135									Scale Type
enter 5.530000 es BW 3.0 MHz			3.0 MHz					pan 0 Hz 0001 pts)	_og <u>Lir</u>

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## **CHANNEL LOADING**



The level of traffic loading on the channel by the EUT is 32.02%

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# 8.7.3. OVERLAPPING CHANNEL TESTS

#### **RESULTS**

These tests are not applicable.

# 8.7.4. MOVE AND CLOSING TIME

## **REPORTING NOTES**

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

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

The aggregate channel closing transmission time is calculated as follows:

Aggregate Transmission Time = (Number of analyzer bins showing transmission) \* (dwell time per bin)

The observation period over which the aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

#### <u>RESULTS</u>

Channel Move Time	Limit
(sec)	(sec)
0.076	10

Aggregate Channel Closing Transmission Time	Limit
(msec)	(msec)
0.0	60

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#### MOVE TIME

RL R	Analyzer - 29445, DFS 1 F 50 Ω AC		SENSE:IN	π		03:26:37 AM N	av 12 2021	
	5.530000000 NFE	GHz PNO: Fast ↔	Trig: Free Rur	Avg	Type: Log-Pwr	TRACE	1 2 3 4 5 6	Frequency
Ba	f Offset -21.3 dB	IFGain:High	#Atten: 0 dB		Δ	Mkr1 76.		Auto Tune
	ef -45.00 dBm					-19.	14 dB	
55.0						D	-64.00 dBm	Center Free
75.0	2 1Δ2							5.530000000 GHz
85.0	<b>*</b>							Start Fred
95.0	da anna tha pharaigh	Namya baya ka bahara	el pinanhand nindhaith	ndow and when		n pharana an	MilMaper	5.530000000 GHz
115			a paint in the second second second					
								Stop Fred
125								
125	)00000 GHz					Sp	an 0 Hz	Stop Fred 5.530000000 GHz CF Step
125 135 Center 5.5300 tes BW 3.0 M	/IHz	#VBV	N 3.0 MHz		•	6.00 s (400	001 pts)	5.530000000 GHz
125 135 enter 5.5300 tes BW 3.0 Μ KR MODE TRC SC 1 Δ2 1 t	AHz Δ × ×	76.00 ms (Δ)	Y -19.14 dB	FUNCTION	Sweep 1		001 pts)	5.530000000 GH; CF Step 3.000000 MH;
125 enter 5.5300 tes BW 3.0 k KR MODE IRC SC 1 Δ2 1 t 2 F 1 t 3 4	AHz Δ × ×		Y	FUNCTION	•	6.00 s (400	001 pts)	5.530000000 GHz CF Step 3.000000 MHz
125 135 center 5.5300 kes BW 3.0 M kr MODE TRC SC 1 A2 1 t 2 F 1 t 3	AHz Δ × ×	76.00 ms (Δ)	Y -19.14 dB	FUNCTION	•	6.00 s (400	001 pts)	5.530000000 GH; CF Step 3.000000 MH; <u>Auto</u> Mar Freq Offse

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## **CHANNEL CLOSING TIME**

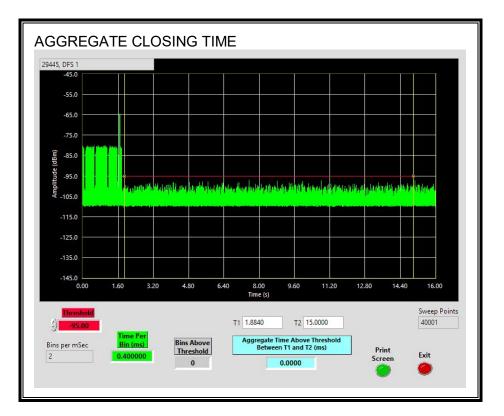
Keysight Spectrum Analyzer - 29445, DFS 1           RL         RF         50 Ω         AC	SENSE:IN	d I	03:33:36 AM May 12, 2021	
enter Freq 5.530000000		Avg Type: Log-Pwr	TRACE 1 2 3 4 5 6 TYPE WWWWWW DET P N N N N N	Frequency
Ref Offset -21.3 dB dB/div Ref -45.00 dBm	irganinigi #Atten. 9 dB	Δ	Mkr1 200.0 ms -37.95 dB	Auto Tuno
pg-				Center Fre
5.0			DL1 -64.00 dBm	5.530000000 GH
5.0 2			TRIG LVL	Start Free 5.53000000 GH
5.0				Stop Free 5.53000000 GH
a ta hiki kibu ki jiw kadini kibu		akadalar pada ang kalang akanad parana	Anthon Control Party and a the	CF Ster
05 myterith, and anythe engineering and	enale also before an example of the of the second		- Salandarina i franciski stan a humur hrok	3.000000 MH <u>Auto</u> Ma
25				Freq Offse
35				0 H
				Scale Type
enter 5.530000000 GHz es BW 3.0 MHz	#VBW 3.0 MHz		Span 0 Hz ).0 ms (40001 pts)	Log <u>Li</u>

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## AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

No transmissions are observed during the aggregate monitoring period.



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# 8.7.5. 30-MINUTE NON-OCCUPANCY PERIOD

#### **RESULTS**

No EUT transmissions were observed on the test channel during the 30-minute observation time.

Ke R		trum Analyze RF	er - 29445, DFS 1 50 Ω AC		SEI	NSE:INT			04:14:44 /	M May 12, 2021		
en	ter Fr	eq 5.53	0000000 NFE	PNO: Fast +	Trig: Free #Atten: 0		Avg Type	: Log-Pwr	TRA T)	CE 1 2 3 4 5 6 PE WWWWWWW ET P NNNNN	Frequer	ю
	3/div		et -21.3 dB .00 dBm	IFGain:High	#Atten: 0	uв			۵Mkr1	1.800 ks 2.52 dB	Auto	Tune
og,											Cente	
										DL1 -64.00 dBm	5.5300000	00 GH:
75.0	Ж <u>2</u>										Star 5.5300000	n <b>t Fred</b> 00 GH:
35.0 35.0											<b>Stoj</b> 5.5300000	<b>p Frec</b> 00 GH:
105	luyhy 	playantlyt	lahija (taku		natul (natul)	iya tulla	-weikaale	ANALASH)	i de la depen		CI 3.00000 <u>Auto</u>	F Step 00 MH: Mar
125		_									Freq	Offse 0 Hi
135											Scale	э Туре
en	ter 5.5	3000000	00 GHz							Span 0 Hz 10001 pts)	Log	Lir

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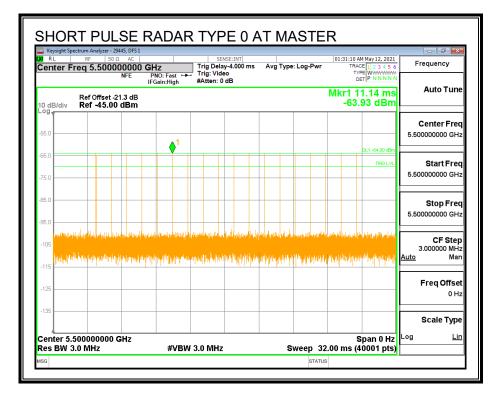
# 8.8. PEER TO PEER MODE EUT RESULTS FOR 20 MHz BANDWIDTH

# 8.8.1. TEST CHANNEL

All tests were performed at a channel center frequency of 5500 MHz.

# 8.8.2. RADAR WAVEFORM AND TRAFFIC

## RADAR WAVEFORM



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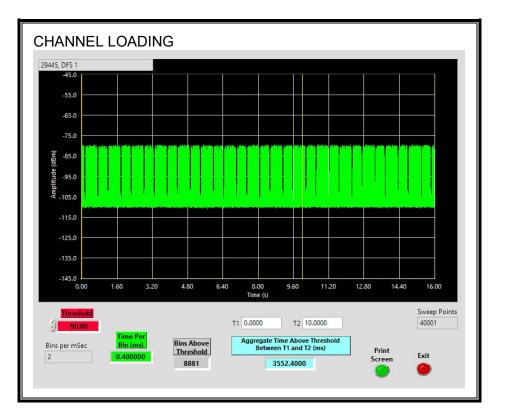
## **TRAFFIC**

Keysight Sp R L	ectrum Analyzer - 2944 RF 50 Ω	AC		SEI	SE:INT			11:57:57 P	M May 13, 2021	- đ <mark>- X</mark>
enter F	req 5.50000	NFE PI	Z NO: Fast ↔ ain:High	Trig: Free #Atten: 0		Avg Type	e: Log-Pwr	TRAC	E 1 2 3 4 5 6 E WWWWWWW T P NNNNN	Frequency
) dB/div	Ref Offset -21 Ref -45.00 (								5.537 s 29 dBm	Auto Tune
5.0										Center Fred
									DL1 -64.00 dBm	5.50000000 GHz
5.0			1							<b>Start Fred</b> 5.500000000 GHz
5.0 · · · ·	90,000 <sup>0</sup> 93690,00103,000	, and a solution of the soluti	i Rola Aluan ellar 	Ninkas elnik ainin	e en itt sen star en vit	felete state shere				<b>Stop Fred</b> 5.50000000 GHz
05										CF Step 3.000000 MHz Auto Mar
15										
25										Freq Offse 0 Ha
35										Scale Type
enter 5. es BW 3	500000000 G	Hz		3.0 MHz			_		pan 0 Hz 0001 pts)	Log <u>Lir</u>

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## **CHANNEL LOADING**



The level of traffic loading on the channel by the EUT is 35.52%

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# 8.8.3. OVERLAPPING CHANNEL TESTS

#### **RESULTS**

These tests are not applicable.

# 8.8.4. MOVE AND CLOSING TIME

## **REPORTING NOTES**

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

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

The aggregate channel closing transmission time is calculated as follows:

Aggregate Transmission Time = (Number of analyzer bins showing transmission) \* (dwell time per bin)

The observation period over which the aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

#### <u>RESULTS</u>

Channel Move Time	Limit
(sec)	(sec)
0.040	10

Aggregate Channel Closing Transmission Time	Limit
(msec)	(msec)
0.0	60

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#### MOVE TIME

	50 Ω AC 5.500000000 NFE	GHz PNO: Fast ↔	SENSE:INT	Avg Type: Log-Pwr	12:04:46 AM May 14, 2021 TRACE 1 2 3 4 5 6 TYPE WWWWWWWWWW DET P N N N N N	Frequency
	Offset -21.3 dB -45.00 dBm	IFGain:High	#Atten: 0 dB	Δ	Mkr1 40.00 ms -17.60 dB	Auto Tuno
5.0 5.0 5.0					DL1 -64.00 dBm	Center Free 5.500000000 GH
15.0	Nijeda je konstruktiva je konstruktiva je konstrukcija je konstrukcija je konstrukcija je konstrukcija je konst	testa stilletspinner	l Henertenstlangilet (kanvitsiaa	un haan daa maanaa daa ahaa ahaa ahaa ahaa ahaa ahaa	llenden og hetter det hetter bog	Start Free 5.500000000 GH
115						Stop Free 5.500000000 GH
enter 5 5000	00000 GHz Hz	#VBV	V 3.0 MHz	•	Span 0 Hz 16.00 s (40001 pts)	CF Step 3.000000 MH <u>Auto</u> Mar
es BW 3.0 M	Х		Y FL	JNCTION FUNCTION WDTH		
es BW 3.0 M <u>KR MODE TRG SCI</u> 1	χ (Δ)	40.00 ms (Δ) 1.655 s		FUNCTION WDTH		Freq Offse 0 H
es BW 3.0 M <b>R MODE TRC SCL</b> 1 Δ2 1 t 2 F 1 t 3 4			-17.60 dB	JACTION FUNCTION WIDTH	FUNCTION VALUE	

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## **CHANNEL CLOSING TIME**

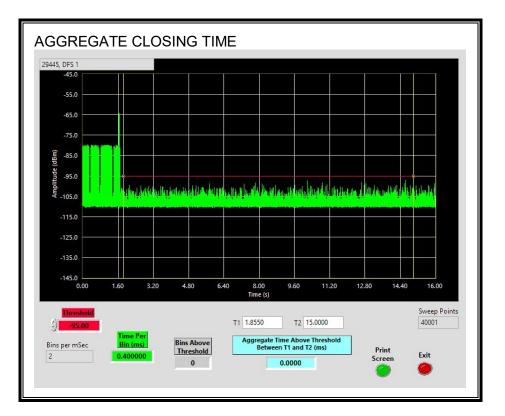
Keysight Spectrum Analyzer - 29445, RL RF 50 Ω		SENSE:INT		12:08:28 AM May 14, 2021	- 0	
enter Freq 5.500000		Trig: Video #Atten: 0 dB	Avg Type: Log-Pwr	TRACE 1 2 3 4 5 6 TYPE WWWWWWW DET P N N N N N	Frequency	
Ref Offset -21.3 dB39.62 dB dB/div Ref -45.00 dBm - 39.62 dB						
g					Center Free	
5.0				DL1 -64.00 dBm	5.500000000 GH	
5.0				TRIG LVL	<b>Start Free</b> 5.500000000 GH:	
					<b>Stop Free</b> 5.500000000 GH	
05 under Standard Standard Standard	epos di terri de debite don se 14 antici en la constante de la const	12 million per de la constant polo Constant de la constant polo de la constant de la c	a mentina de astrono da fameridadan astronom de fam a mentina mentina per gastipantinam astronom de familia	ontari kana para mana panjaranja	CF Step 3.000000 MH Auto Mar	
25					Freq Offse 0 H	
35					Scale Type	
enter 5.500000000 GH: es BW 3.0 MHz		3.0 MHz		Span 0 Hz 0 ms (40001 pts)	Log <u>Lii</u>	

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#### AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

No transmissions are observed during the aggregate monitoring period.



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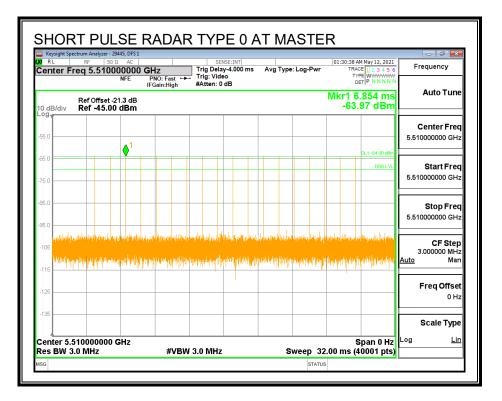
### 8.9. PEER TO PEER MODE EUT RESULTS FOR 40 MHz BANDWIDTH

### 8.9.1. TEST CHANNEL

All tests were performed at a channel center frequency of 5510 MHz.

### 8.9.2. RADAR WAVEFORM AND TRAFFIC

### RADAR WAVEFORM



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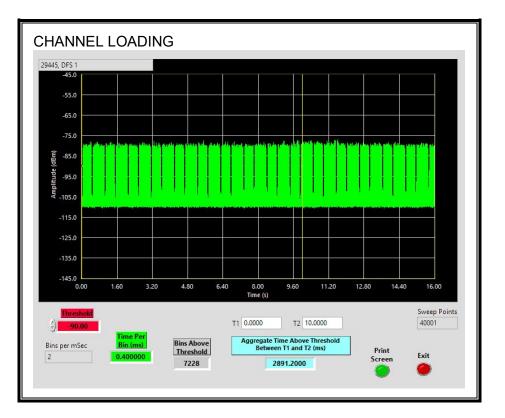
#### **TRAFFIC**

eysight Spectrum Analyze RL RF nter Freq 5.51	50 Ω AC		SENS		Avg Type	: Log-Pwr	TYPE	1 2 3 4 5 6	Frequency
dB/div Ref -45		NO: Fast ↔→ Gain:High	#Atten: 0 d				DET	<sup>P NNNNN</sup> 11.61 s '9 dBm	Auto Tun
.0									Center Fre 5.510000000 GH
5.0					Maxista 1	<b>∳</b> <sup>1</sup>		L1 -64.00 dBm	Start Free 5.510000000 GH
երի կոր երի հետ 5.0 5.0	n feið enn skilfir stærskir skillir	ahtina kaliy diputa dala		al for a first search		and the second second		n pier with pi	<b>Stop Fre</b> 5.51000000 GH
					Notice (Devel electrice of				CF Stej 3.000000 MH Auto Ma
25									Freq Offse 0 H
35									Scale Typ
enter 5.5100000 es BW 3.0 MHz	00 GHz	#VBW :	3.0 MHz			Sween	Sp 16.00 s (40		.og <u>Li</u>

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#### **CHANNEL LOADING**



The level of traffic loading on the channel by the EUT is 28.91%

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### **8.9.3. OVERLAPPING CHANNEL TESTS**

#### **RESULTS**

These tests are not applicable.

### 8.9.4. MOVE AND CLOSING TIME

#### **REPORTING NOTES**

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

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

The aggregate channel closing transmission time is calculated as follows:

Aggregate Transmission Time = (Number of analyzer bins showing transmission) \* (dwell time per bin)

The observation period over which the aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

#### <u>RESULTS</u>

Channel Move Time	Limit
(sec)	(sec)
0.0944	10

Aggregate Channel Closing Transmission Time	Limit
(msec)	(msec)
0.0	60

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#### MOVE TIME

	RF 50 Ω AC	S 1	SENSE:	INT		12:13:51 AM	May 14, 2021	
enter Frec	1 5.5100000 NFE	PNO: Fast	Trig: Free Ru #Atten: 0 dB		g Type: Log-Pwr	TYP	E 1 2 3 4 5 6 E WWWWWW T P N N N N N	Frequency
	tef Offset -21.3 di tef -45.00 dBn		#Atten: 0 dB		Δ	Mkr1 94	·	Auto Tune
og								Center Free
75.0	X <mark>2</mark>						0L1 -64.00 dBm	5.510000000 GH;
95.0		rinden alused	anti algun din suar sa	. Localite concernant at	utiling data and a later	thalite com	be decade a d	Start Fred 5.510000000 GH;
105	an terlitik a stillet k.	alan da ka	ita kang para ana a kang	lingani, ga nahirik	An Alan Alakin jaraja	a nai an ina dhina.	J & GANNA KANDANI	
125								Stop Fred 5.51000000 GHz
135								
es BW 3.0			W 3.0 MHz	EUNCTION	•	16.00 s (4		CF Step 3.000000 MHz <u>Auto</u> Mar
enter 5.510 tes BW 3.0 KR MODE TRG S	MHz cline (Δ)	94.40 ms (/	Y () -24.68 dB	FUNCTION	Sweep 1		0001 pts)	3.000000 MHz <u>Auto</u> Mar
enter 5.510 es BW 3.0 M MODE TREE 1 A2 1 2 F 1 3 4 5	MHz cl	x	Y	FUNCTION	•	16.00 s (4	0001 pts)	3.000000 MH
Center 5.510 Ces BW 3.0 Contex	MHz cline (Δ)	94.40 ms (/	Y () -24.68 dB	FUNCTION	•	16.00 s (4	0001 pts)	3.000000 MH <u>Auto</u> Mar Freq Offse

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#### **CHANNEL CLOSING TIME**

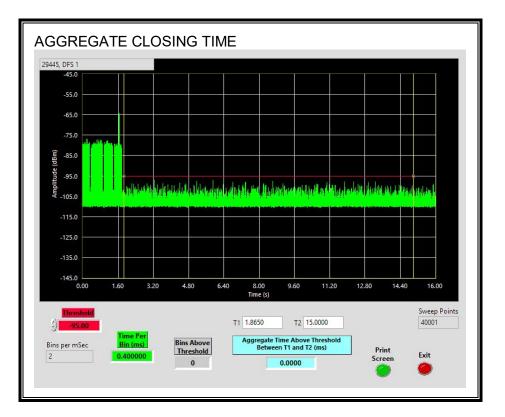
Keysight Spectrum Analyzer - 29445, DFS 1 RL RF 50 Q AC		SENSE:INT	Type: Log-Pwr	12:17:50 AM May 14, 2021 TRACE 1 2 3 4 5 6	Frequency
enter Freq 5.510000000 NFE	BHZ PNO: Fast ↔→ Trig: Vi IFGain:High #Atten:	deo	i Type: Log-Pwr	TYPE WWWWWW DET P NNNNN	
Ref Offset -21.3 dB dB/div Ref -45.00 dBm			ΔN	lkr1 200.0 ms -37.82 dB	Auto Tune
99-					Center Free
5.0				DL1 -64.00 dBm	5.510000000 GH
5.0 2				TRIGLYL	Start Free 5.510000000 GH:
5.0					Stop Fred 5.510000000 GH;
15		n fel som for her som for de som for som	an fel filmed a series film (film and film a film) Af film a series and film (film a film)	and the second	CF Step 3.000000 MH: Auto Mar
25					Freq Offse 0 H
35					Scale Type
enter 5.510000000 GHz es BW 3.0 MHz	#VBW 3.0 MH			Span 0 Hz 0 ms (40001 pts)	Log <u>Lir</u>

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#### AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

No transmissions are observed during the aggregate monitoring period.



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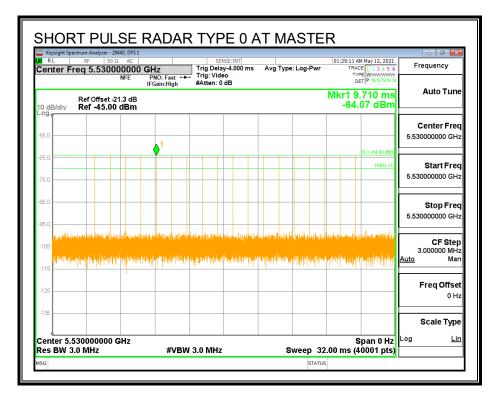
### 8.10. PEER TO PEER MODE EUT RESULTS FOR 80 MHz BANDWIDTH

### 8.10.1. TEST CHANNEL

All tests were performed at a channel center frequency of 5530 MHz.

### 8.10.2. RADAR WAVEFORM AND TRAFFIC

#### RADAR WAVEFORM



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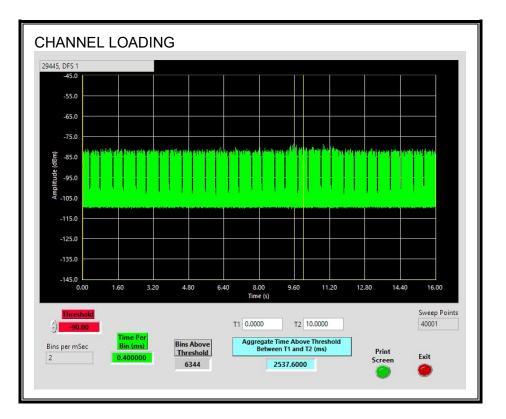
#### **TRAFFIC**

Keysight Spectrum Analyzer - 29445, DFS 1 R L RF 50 Ω AC		E:INT		12:20:09 AM May 14, 2021	Frequency
enter Freq 5.53000000 ( NFE	BHZ PNO: Fast ↔→ Trig: Free I IFGain:High #Atten: 0 d	Run	: Log-Pwr	TRACE 1 2 3 4 5 6 TYPE WWWWWWW DET P N N N N N	
Ref Offset -21.3 dB dB/div Ref -45.00 dBm				Mkr1 9.567 s -78.50 dBm	Auto Tune
pg.					Center Free
5.0				DL1 -64.00 dBm	5.530000000 GH;
5.0		1		DC1-04.00 0Dm	Start Fred 5.530000000 GH
5.0 Hi an talan dan manakan ana ana ang sala ang	n an	dere por edit wite einerder	l dina dala pomba	daj nem keonomolowi dank 	<b>Stop Fred</b> 5.53000000 GHz
					CF Step 3.000000 MHz Auto Mar
15					Erog Offoo
25					Freq Offse 0 Ha
35					Scale Type
enter 5.530000000 GHz				Span 0 Hz	.og <u>Lir</u>

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#### **CHANNEL LOADING**



The level of traffic loading on the channel by the EUT is 25.37%

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### 8.10.3. OVERLAPPING CHANNEL TESTS

#### **RESULTS**

These tests are not applicable.

### 8.10.4. MOVE AND CLOSING TIME

#### **REPORTING NOTES**

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

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

The aggregate channel closing transmission time is calculated as follows:

Aggregate Transmission Time = (Number of analyzer bins showing transmission) \* (dwell time per bin)

The observation period over which the aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

#### <u>RESULTS</u>

Channel Move Time	Limit
(sec)	(sec)
0.1056	10

Aggregate Channel Closing Transmission Time	Limit
(msec)	(msec)
0.0	60

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#### MOVE TIME

RL RF	zer - 29445, DFS 1 50 Ω AC		SENSE	INT		12:23:31 AM M	av 14, 2021	- # <b>*</b>
enter Freq 5.53	30000000 G	PNO: Fast ++	Trig: Free R	Av lun	g Type: Log-Pwr	TRACE	23456 WWWWWWW PNNNNN	Frequency
Ref Offs	set -21.3 dB	FGain:High	#Atten: 0 dE	3	Δ	Mkr1 105	.6 ms	Auto Tune
	5.00 dBm					-20.	23 dB	
55.0						DL1	-64.00 dBm	Center Fred 5.530000000 GH
75.0	<u>2</u>							
85.0 1.00% Min.ek								Start Fred 5.530000000 GHz
105	tot I. Andrew Brits and State and A	THE PARTY AND A	n Albanias (1905 an Albana)	an allana alla ana di la an	dheap <sup>l</sup> e bleachgald	died. Al freis, and assistant	despirate	
115	tot A. Office and the state of the state				d de recente de la deserve	alled - 24 brain and an and an an	allerin terif	Stop Fred
115								
115 125 135 center 5.5300000						Spa	an 0 Hz	5.530000000 GH; CF Step
1105 115 125 135 2 center 5.5300000 ces BW 3.0 MHz	000 GHz		V 3.0 MHz		Sweep 1	Spa 16.00 s (400	an 0 Hz 101 pts)	Stop Frec 5.53000000 GHz CF Step 3.00000 MHz Auto Mar
115 125 135 enter 5.5300000 es BW 3.0 MHz IXR MODE TRC SCL 1 Δ2 1 t (Δ)	000 GHz	#VBW	V 3.0 MHz -20.23 dB	FUNCTION		Spa	an 0 Hz 101 pts)	5.530000000 GH; CF Step 3.000000 MH;
115 125 135 135 135 135 135 135 135 13	000 GHz	#VBW	¥ 3.0 MHz	FUNCTION	Sweep 1	Spa 16.00 s (400	an 0 Hz 101 pts)	5.530000000 GH: CF Step 3.000000 MH:
115	000 GHz	#VBW	V 3.0 MHz -20.23 dB	FUNCTION	Sweep 1	Spa 16.00 s (400	an 0 Hz 101 pts)	5.530000000 GH; CF Step 3.000000 MH; <u>Auto</u> Mar Freq Offse

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#### **CHANNEL CLOSING TIME**

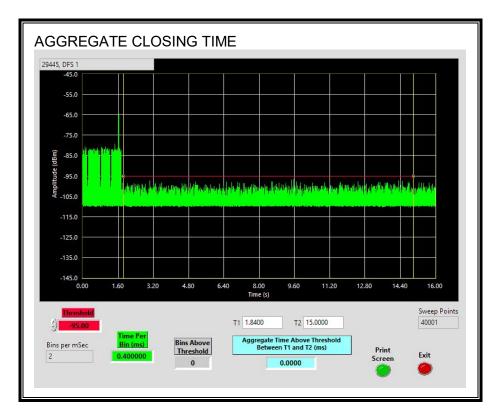
Keysight Spectrum Analyzer - 29445, DFS 1           RL         RF         50 \Omega         AC           Inter Freq 5.530000000 G	SENSE:INT	Avg Type: Log-Pwr	12:26:44 AM May 14, 2021 TRACE 1 2 3 4 5 6	Frequency
NFE	HZ PNO: Fast ↔ Trig: Video Gain:High #Atten: 0 dB	Avg Type. Log-Fwi		
Ref Offset -21.3 dB dB/div Ref -45.00 dBm		Δι	kr1 200.0 ms -38.02 dB	Auto Tune
99-				Center Free
5.0			DL1 -64.00 dBm	5.530000000 GH
5.0 2 5.0			TRIG LVL	Start Free 5.530000000 GH
				<b>Stop Fred</b> 5.530000000 GH;
	tel et al form 122 d'arren es pelos timbre de la constante de la c	dan fan fan sen en sen de sen de sen sen sen sen sen sen sen sen sen se	ala mpanala meneri dalam dan basi period	CF Step 3.000000 MH: Auto Mar
25				Freq Offse 0 H
35				Scale Type
enter 5.530000000 GHz			Span 0 Hz	Log <u>Lir</u>

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#### AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

No transmissions are observed during the aggregate monitoring period.



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#### 8.10.5. 30-MINUTE NON-OCCUPANCY PERIOD

#### **RESULTS**

No EUT transmissions were observed on the test channel during the 30-minute observation time.

Keysight Spectrum Analyzer RL RF 50			ENSE:INT			01:04:58 AN	4 May 14, 2021	- ē 💌
enter Freq 5.530	NFE PNO:	Fast 🛶 Trig: Fr	ee Run	Avg Type	: Log-Pwr	TRAC	E 1 2 3 4 5 6 E WWWWWWW T P N N N N N	Frequency
Ref Offset		High #Atten:	0 dB			۵Mkr1 1		Auto Tune
								Center Fred
5.0								5.530000000 GH
5.0							DL1 -64.00 dBm	Start Fred
5.0								5.530000000 GH;
5.0 <mark>X2</mark>								Stop Fred
5.0 -								5.530000000 GH
	n palattilija. Ali	nte bengiliken	hanalaha	haliyan Ayu	laatelij ( <sup>d</sup> ore	mpilaata		CF Step 3.000000 MH: <u>Auto</u> Mar
25								Freq Offse 0 H:
35								Scale Type
enter 5.530000000	GHz					S 000 ks (4	pan v nz	Log <u>Lir</u>

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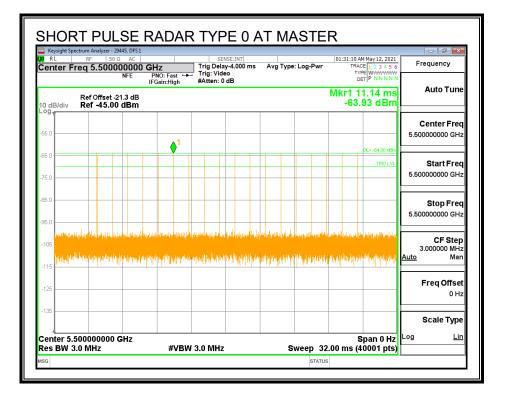
### 8.11. PEER TO PEER MODE PEER SLAVE DEVICE RESULTS FOR 20 MHz BANDWIDTH

### 8.11.1. TEST CHANNEL

All tests were performed at a channel center frequency of 5500 MHz.

### 8.11.2. RADAR WAVEFORM AND TRAFFIC

#### RADAR WAVEFORM



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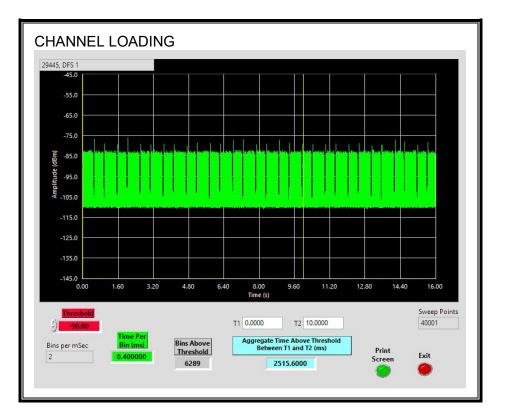
#### **TRAFFIC**

Keysight Spectrum Analyzer - 29445, DFS 1           R L         RF         50 Ω         AC	SENSE:INT		01:20:05 AM May 14, 2021	
enter Freq 5.500000000 ( NFE		Avg Type: Log-Pwr	TRACE 1 2 3 4 5 6 TYPE WWWWWW DET P N N N N N	Frequency
Ref Offset -21.3 dB dB/div Ref -45.00 dBm			Mkr1 2.046 s -76.03 dBm	Auto Tune
99 9.0				Center Fred 5.500000000 GH:
5.0			DL1 -64.00 dBm	Start Fred 5.50000000 GH;
5.0 with the count we were the first service 5.0		hite provinces are set the correction of	al to the star way and not be	<b>Stop Fred</b> 5.50000000 GH:
				CF Step 3.000000 MH <u>Auto</u> Mar
25				Freq Offse 0 H:
35				Scale Type
enter 5.500000000 GHz es BW 3.0 MHz	#VBW 3.0 MHz		Span 0 Hz 16.00 s (40001 pts)	Log <u>Lir</u>

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#### **CHANNEL LOADING**



The level of traffic loading on the channel by the Peer Slave is 25.15%

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### 8.11.3. OVERLAPPING CHANNEL TESTS

#### **RESULTS**

These tests are not applicable.

### 8.11.4. MOVE AND CLOSING TIME

#### **REPORTING NOTES**

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

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

The aggregate channel closing transmission time is calculated as follows:

Aggregate Transmission Time = (Number of analyzer bins showing transmission) \* (dwell time per bin)

The observation period over which the aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

#### <u>RESULTS</u>

Channel Move Time	Limit
(sec)	(sec)
4.162	10

Aggregate Channel Closing Transmission Time	Limit
(msec)	(msec)
6.0	60

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#### MOVE TIME

RL RF	alyzer - 29445, DFS 1 50 Ω AC	SEN	ISE:INT		01:23:16 AM May 14, 2021	
enter Freq 5.	500000000 GHz NFE PNO: F IFGain:	Fast +++ Trig: Free	Run	Type: Log-Pwr	TRACE 1 2 3 4 5 6 TYPE WWWWWW DET P N N N N	
	ffset -21.3 dB -45.00 dBm				ΔMkr1 4.162 s -19.25 dB	
<b>og</b>						Center Fred
55.0 2					DL1 -64.00 dBm	5.50000000 GH
75.0		1Δ2				Start Fred
95.0	talateta di adia di adia da di a	e alla a la site colto detta		latanic matrix	and role along the later	5 50000000 GH
105		ud film a runnautha da	ditana tang ang sa	nu iff, of chiefforch	officials, references ambients	
125						<b>Stop Fred</b> 5.500000000 GH2
enter 5.50000	0000 GHz				Span 0 Hz	CF Ster
tes BW 3.0 MH	-	#VBW 3.0 MHz		•	6.00 s (40001 pts)	
$\frac{1}{2} \frac{\Delta 2}{F} \frac{1}{1} \frac{1}{t} $	× Δ) 4.162 1.568	2 s (Δ) -19.25 3 s -64.11 dE		FUNCTION WIDTH	FUNCTION VALUE	
3 4 5	1.000	5 -04.11 de			E	Freq Offse 0 Ha
6 7 8						Scale Type
9						

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#### **CHANNEL CLOSING TIME**

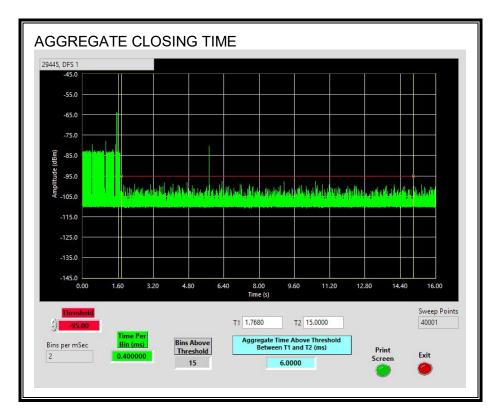
Keysight Spectrum Analyzer - 29445, DFS 1           RL         RF         50 Ω         AC	SENSE:INT		01:27:22 AM May 14, 2021	
enter Freq 5.50000000 G		Avg Type: Log-Pwr	TRACE 1 2 3 4 5 6 TYPE WWWWWW DET P N N N N N	Frequency
Ref Offset -21.3 dB dB/div Ref -45.00 dBm	cancely writen o db	ΔN	lkr1 200.0 ms -38.72 dB	Auto Tune
pg -				Center Free
5.0			DL1 -64.00 dBm	5.500000000 GH
5.0 <b>2</b>			TRIGLVL	<b>Start Free</b> 5.500000000 GH:
				<b>Stop Free</b> 5.500000000 GH
			nan ang sa	CF Step 3.000000 MH Auto Mar
25				Freq Offse 0 H
35				Scale Type
enter 5.500000000 GHz es BW 3.0 MHz	#VBW 3.0 MHz		Span 0 Hz 0 ms (40001 pts)	Log <u>Lir</u>

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#### AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

Only intermittent transmissions are observed during the aggregate monitoring period.



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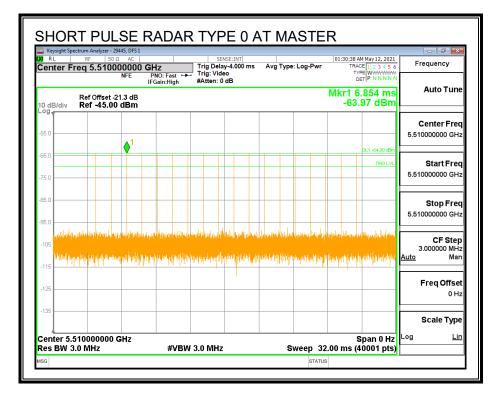
### 8.12. PEER TO PEER MODE PEER SLAVE DEVICE RESULTS FOR 40 MHz BANDWIDTH

### 8.12.1. TEST CHANNEL

All tests were performed at a channel center frequency of 5510 MHz.

### 8.12.2. RADAR WAVEFORM AND TRAFFIC

#### RADAR WAVEFORM



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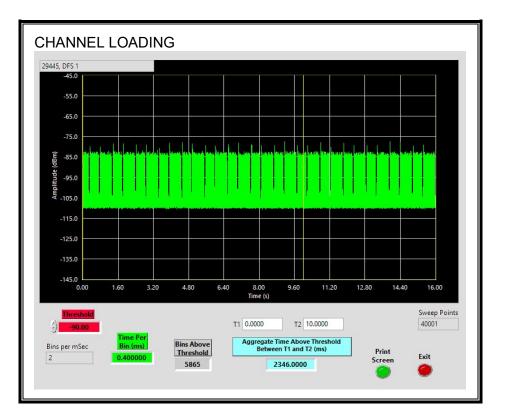
#### **TRAFFIC**

	AC	SENSE:INT		01:28:45 AM May 14, 2021	Erectioner
nter Freq 5.510000		∴ Trig: Free Run #Atten: 0 dB	Avg Type: Log-Pwr	TRACE 1 2 3 4 5 6 TYPE DET P N N N N N	Frequency
Ref Offset -21.3 dB/div Ref -45.00 dB				Mkr1 9.170 s -77.30 dBm	Auto Tune
g					Center Free
.0				DL1 -64.00 dBm	5.510000000 GH;
.0			1		<b>Start Fred</b> 5.510000000 GH
s. o <mark>nav view verste Vinut som er sede verste</mark>	ana shadi waa maad waa di	an mu a tar mar ana mar	lan bu konn nadir. Dun binger was mus	tills, situs nie belaid abet voer	Stop Fred
5.0					5.510000000 GH
05					CF Step 3.000000 MH
15					<u>Auto</u> Mar
25					Freq Offse 0 Ha
35					Scale Type
enter 5.510000000 GH es BW 3.0 MHz		V 3.0 MHz		Span 0 Hz 16.00 s (40001 pts)	Log <u>Lir</u>

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#### **CHANNEL LOADING**



The level of traffic loading on the channel by the Peer Slave is 23.46%

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### 8.12.3. OVERLAPPING CHANNEL TESTS

#### **RESULTS**

These tests are not applicable.

### 8.12.4. MOVE AND CLOSING TIME

#### **REPORTING NOTES**

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

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

The aggregate channel closing transmission time is calculated as follows:

Aggregate Transmission Time = (Number of analyzer bins showing transmission) \* (dwell time per bin)

The observation period over which the aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

#### <u>RESULTS</u>

Channel Move Time	Limit
(sec)	(sec)
0.1364	10

Aggregate Channel Closing Transmission Time	Limit
(msec)	(msec)
0.0	60

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#### MOVE TIME

	50 Ω AC	SENSE:INT		01:31:55 AM May 14, 2021	
	0000000 GHz NFE PNO: Fast	Trig: Free Run #Atten: 0 dB	Avg Type: Log-Pwr	TRACE 1 2 3 4 5 6 TYPE WWWWWW DET P N N N N N	Frequency
	IFGain:High et -21.3 dB 5.00 dBm	#Atten: 0 dB	Δ	Mkr1 136.4 ms -29.29 dB	Auto Tune
og 55.0					
65.0 2				DL1 -64.00 dBm	Center Fred 5.510000000 GH:
a5.0 m astronom 1∆2					Start Fred 5,510000000 GH;
105	and Albertant, and Distant	uko optikila optikatok opti	gewalet deuter wat blever	alphates a block and by a	5.51000000 GH
115					Stop Fred
125					5.51000000 GHz
				Span 0 Hz	CF Step
			Swoon 1		
enter 5.5100000 es BW 3.0 MHz		BW 3.0 MHz	Sweep 1	6.00 s (40001 pts)	3.000000 MHz <u>Auto</u> Mar
Res BW 3.0 MHz KR MODE TRC SCL	#VI	Y FU	•	6.00 s (40001 pts)	3.000000 MHz <u>Auto</u> Mar
Res         BW         3.0         MHz           1         Δ2         1         t         (Δ)           2         F         1         t         (Δ)           3         4         5         5         5	#VI × 136.4 ms (	Y FU (Δ) -29.29 dB	•	6.00 s (40001 pts)	3.000000 MHz
es BW 3.0 MHz KR MODE TRC SCL 1 $\Delta 2$ 1 t $(\Delta)$ 2 F 1 t 3 4	#VI × 136.4 ms (	Y FU (Δ) -29.29 dB	•	6.00 s (40001 pts)	3.000000 MH <del>i</del> <u>Auto</u> Mar Freq Offse

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#### **CHANNEL CLOSING TIME**

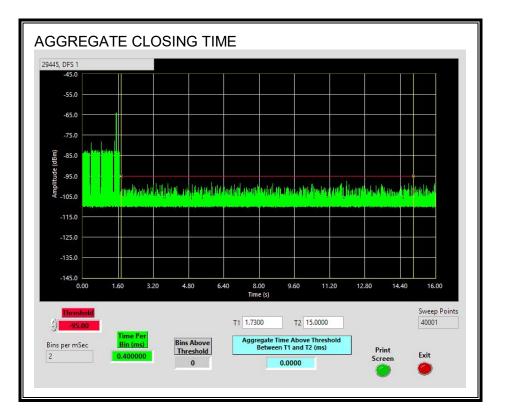
Keysight Spectrum Analyzer - 29445, DFS 1 RL RF 50 Ω AC	SENSE:INT	Avg Type: Log-Pwr	01:35:57 AM May 14, 2021 TRACE 1 2 3 4 5 6	Frequency
enter Freq 5.510000000 G NFE	PNO: Fast +++ Trig: Video FGain:High #Atten: 0 dB	Avg Type. Log-Pwi		
Ref Offset -21.3 dB dB/div Ref -45.00 dBm		ΔΝ	/kr1 200.0 ms -38.82 dB	Auto Tune
og -				Center Free
5.0			DL1 -64.00 dBm	5.510000000 GH
5.0			TRIG LVL	Start Free 5.510000000 GH:
5.0				<b>Stop Free</b> 5.510000000 GH:
	ing the second	taa Dela plan ee daa yil ee daa bila bira daa Aada ahaa ahaa ahaa ahaa ahaa ahaa ahaa	a na ana ana ana ana ana ana ana ana an	CF Step 3.000000 MH: Auto Mar
25				Freq Offse 0 H:
35				Scale Type
enter 5.510000000 GHz es BW 3.0 MHz	#VBW 3.0 MHz		Span 0 Hz 0 ms (40001 pts)	_og <u>Lir</u>

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#### AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

No transmissions are observed during the aggregate monitoring period.



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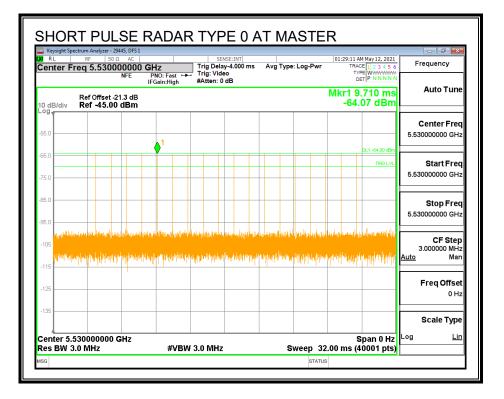
### 8.13. PEER TO PEER MODE PEER SLAVE DEVICE RESULTS FOR 80 MHz BANDWIDTH

### 8.13.1. TEST CHANNEL

All tests were performed at a channel center frequency of 5530 MHz.

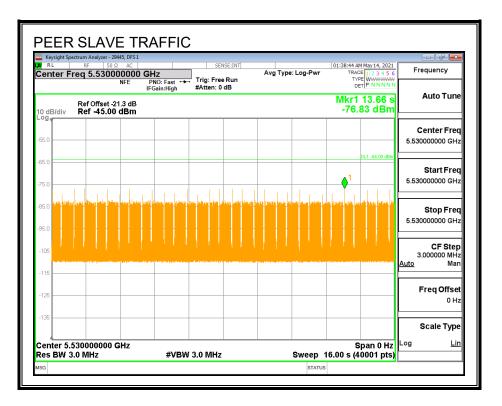
### 8.13.2. RADAR WAVEFORM AND TRAFFIC

#### RADAR WAVEFORM



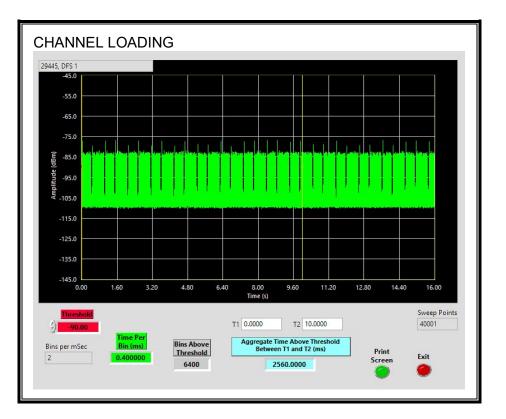
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#### **TRAFFIC**



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#### **CHANNEL LOADING**



The level of traffic loading on the channel by the Peer Slave is 25.6%

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### 8.13.3. OVERLAPPING CHANNEL TESTS

#### **RESULTS**

These tests are not applicable.

### 8.13.4. MOVE AND CLOSING TIME

#### **REPORTING NOTES**

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

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

The aggregate channel closing transmission time is calculated as follows:

Aggregate Transmission Time = (Number of analyzer bins showing transmission) \* (dwell time per bin)

The observation period over which the aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

#### <u>RESULTS</u>

Channel Move Time	Limit
(sec)	(sec)
0.0344	10

Aggregate Channel Closing Transmission Time	Limit
(msec)	(msec)
0.0	60

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#### MOVE TIME

RL RI	Analyzer - 29445, DFS 1 F 50 Ω AC		SENSE:INT		01:42:09 AM May 14, 2021	
enter Freq	5.530000000 NFE	PNO: Fast ++	Trig: Free Run #Atten: 0 dB	Avg Type: Log-Pwr	TRACE 1 2 3 4 5 6 TYPE WWWWWW DET P N N N N N	Frequency
	f Offset -21.3 dB	IFGain:High	#Atten: 0 dB		ΔMkr1 34.40 ms -20.34 dB	Auto Tun
<sup>og</sup>	ef -45.00 dBm				-20.04 015	
5.0 5.0	( <mark>2</mark>				DL1 -64.00 dBm	Center Fre 5.530000000 GH
5.0 1.0010 000 00 5.0		landrad astronomical as	nja tijelana kilon i papate	noted to constitute the first of a constitute of the	, al lander de provinsier verligen <mark>bender de b</mark>	<b>Start Fre</b> 5.530000000 GH
115						Stop Fre
125						5.530000000 GH
enter 5.5300 es BW 3.0 M	1Hz	#VBV	V 3.0 MHz	Sweep	Span 0 Hz 16.00 s (40001 pts)	CF Ste 3.000000 MH <u>Auto</u> Ma
	(Δ)	34.40 ms (Δ) 1.618 s		FUNCTION FUNCTION WIDT	FUNCTION VALUE	
3 4 5		1.010 3	-04.10 0.011		E	Freq Offse 0 H
6 7 8						Scale Typ
9						Log Li

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#### **CHANNEL CLOSING TIME**

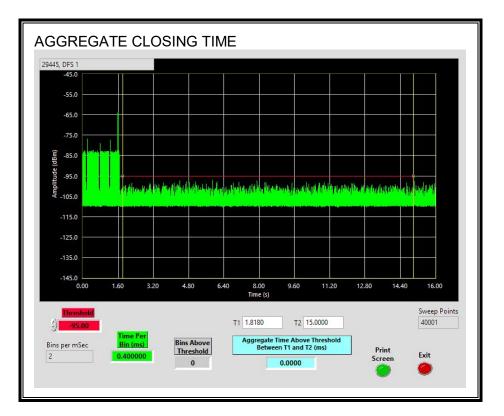
Keysight Spectrum Analyzer - 29445, DFS 1 RL RF 50 Ω AC		SENSE:INT		01:44:58 AM May 14, 2021	- 7 💌
enter Freq 5.530000000 NFE	PNO: Fast +++ TI	rig: Video Atten: 0 dB	Avg Type: Log-Pwr	TRACE 1 2 3 4 5 6 TYPE WWWWWW DET P N N N N N	Frequency
Ref Offset -21.3 dB dB/div Ref -45.00 dBm	ir Gain: nign		۵	Mkr1 200.0 ms -37.89 dB	Auto Tune
pg.					Center Free
5.0				DL1 -64.00 dBm	5.530000000 GH
5.0				TRIG LVL	Start Free
5.0					5.530000000 GH
5.0					Stop Free
5.0					5.53000000 GH
U HULPU I U UVI I U UVI U U U U U U U U U U U			and the property of the state o	a frega verge klaver og det av det av sen det er Greg av en en skriver av en sen	CF Step 3.000000 MH
15					Auto Mar
					Freq Offse
25					0 H:
35					Scale Type
enter 5.530000000 GHz				Span 0 Hz 0.0 ms (40001 pts)	Log <u>Lir</u>

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#### AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

No transmissions are observed during the aggregate monitoring period.



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#### 8.13.5. 30-MINUTE NON-OCCUPANCY PERIOD

#### **RESULTS**

No EUT transmissions were observed on the test channel during the 30-minute observation time.

Keysight Spectrum Analyzer - 2 RL RF 50		SENSE:INT		02:24:01 AM May 14, 2021	
enter Freq 5.5300			Avg Type: Log-Pwr	TRACE 1 2 3 4 5 6 TYPE WWWWWW DET P N N N N N	Frequency
Ref Offset -	Auto Tun				
odB/div Ref -45.00	dBm			-20.38 dB	
5.0					Center Free 5.53000000 GH
5.0				DL1 -64.00 dBm	
5.0					Start Free 5.530000000 GH
5.0 <b>X2</b>					<b>Stop Fre</b> 5.530000000 GH
	te yaktudika kepinyan	le landeren televile	lderhandfilder <sup>ja</sup> ldstagkeper		CF Step 3.000000 MH <u>Auto</u> Mai
25					Freq Offse 0 H
35					Scale Type
enter 5.530000000	GHz			Span 0 Hz	Log <u>Lir</u>

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## 9. SETUP PHOTOS

Please see setup photo report 13573777-EP1V1

# **END OF REPORT**

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