

# ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

Applicant:	Digi International Inc 9350 Excelsior Blvd., Suite 700	Hopkins MN 55343
Product Name:	ConnectCore 8X	
Brand Name:	Digi	
Model No.:	CC8X	
Model Difference:	N/A	
Report Number:	ER/2019/B0068	
FCC ID:	MCQ-CCIMX8	
IC:	1846A-CCIMX8	
FCC Rule Part:	§15.407, Cat: NII	
ISED RSS:	RSS-247 issue 2 Feb. 2017	
Issue Date:	Jul. 10, 2020	
Date of Test:	Dec. 04, 2019 ~ Feb 07, 2020	
Date of EUT	Dec. 04, 2019	
Received:		

## We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Central RF Lab The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10: 2013 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits.

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

Approved By: \_\_\_\_\_\_CHUN; CHIZEH, CHIEN

CHUN-CHIEH, CHEN / Supervisor



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Revision History				
Report Number         Revision         Description         Issue Date         Remark				
ER/2019/B0068	Rev.00	Original.	Jul. 10, 2020	Revised By: Susan Lin

### Note:

1 · Disclaimer

Antenna information is provided by the applicant, test results of this report are applicable to the sample EUT received.

2 . The test data in this test report is fully leveraged from the TAF code 0513. Since the laboratory's TAF code has been updated to 3702, this test report is being issued by the laboratory of TAF code 3702.

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#### **GENERAL INFORMATION** 1

### **1.1 Product Description**

Product Nan	ne:	ConnectCore 8X	
Brand Name	:	Digi	
Model No.:		CC8X	
Model Differ	ence:	N/A	
Hardware Ve	ersion:	55001984-02 rev 4P	
Software Ver	rsion:	82004286 rev 4P	
EUT Serial N	lumber:	F191001000424	
		5Vdc from AC/DC Adapter	
Power Supply: Adapter: Model No.: GT-46180-1605, Supplier: GlobTek Inc		Adapter: Model No.: GT-46180-1605, Supplier:. GlobTek, Inc.	
Modulation type: 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 802.11ac only			
Transition Rate:	802.11 n_2	6/9/12/18/24/36/48/54 Mbps802.11 ac_20MHz: 6.5 –173.3Mbps20MHz: 6.5 – 144.4Mbps802.11 ac_40MHz: 13.5 –400.0Mbps40MHz: 13.5 – 300.0Mbps802.11 ac_80MHz: 29.3 – 866.7Mbps	

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### **1.2 Antenna Designation**

Antenna Type	Supplier	Antenna Part No.	Freq. (MHz)	Peak Antenna Gain (dBi)	Worst Antenna Gain
			5150~5250	4.9	
	VAOEO		5250~5350	3.9	
PCB	YAGEO	ANTX100P001B24553	5470~5725	5.1	
			(MHz) 5150~5250 5250~5350 5470~5725 5725~5850 5150~5250 5250~5350 5470~5725 5725~5850 5150~5250 5250~5350 5470~5725 5725~5850 5150~5250 5250~5350 5470~5725 5725~5850 5150~5250 5250~5350 5470~5725 5725~5850 5150~5250 5250~5350 5470~5725 5725~5850 5150~5250 5250~5350 5470~5725 5725~5850 5150~5250 5250~5350 5470~5725 5725~5850 5150~5250 5470~5725 5725~5850 5150~5250 5470~5725 5725~580 5470~5725 5725~580 5470~5725 5725~580 5470~5725 5725~580 5470~5725 5725~580	5.1	
			5150~5250	6.11	V
РСВ	TAOGLAS		5250~5350	6.11	V
PCD	TAUGLAS	FXP830.07.0100C	5470~5725	6.11	V
			5725~5850	6.11	V
			5150~5250	4.56	
Dinala			5250~5350	4.56	
Dipole	TAOGLAS	GW.48.A151	5470~5725	4.56	
			5725~5850	4.56	
			5150~5250	4.63 (Port 1) 4.61 (Port 2)	
			5250~5350	4.63 (Port 1) 4.61 (Port 2)	
PCB	TAOGLAS	FXP522.A.07.A.001	5470~5725	4.63 (Port 1) 4.61 (Port 2)	
			5725~5850	4.63 (Port 1) 4.61 (Port 2)	
			5150~5250	4.6	V
<b>D</b> : 1				4.6	V
Dipole	Linx	ANT-DB1-RAF-RPS	5470~5725	4.6	V
			5725~5850	4.6	V
			5150~5250	5	
DOD		1001000	5250~5350	5	
PCB	ethertronic	1001932	5470~5725	5	
			5725~5850	5	
			5150~5250	5.5	
<b>D</b> 00			5250~5350	5.5	
PCB	TAOGLAS	FXP831.07.0100C	5470~5725	5.5	
			5725~5850	5.5	
(ANT-DB1-RA	F-RPS) results	on the above 7 antennas, th higher emission at 5GHz. T enna to be presented on this	herefore, the c		

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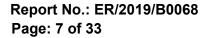


### 1.3 FCC worst power

Wi-Fi 802.11	Frequency Range	Channels	Rated Power (Avg.) (dBm) (Worst case)	Modulation Technology
	5150~5250	4	11.99	
	5250~5350	4	16.55	OFDM
а	5470~5725	12	16.16	OFDIM
	5725-5850	5	16.24	
	5150~5250	4	HT: 12.49	
n_HT ac_VHT	5250~5350	4	HT: 15.56	OFDM
20M	5470~5725	12	HT: 15.49	OFDIVI
	5725-5850	5	HT: 15.22	
	5150~5250	2	HT: 13.67	
n_HT ac_VHT	5250~5350	2	HT: 15.74	OFDM
40M	5470~5725	5	HT: 15.81	OFDIM
	5725-5850	2	HT: 15.48	
	5150~5250	1	VHT: 11.01	
ac_VHT 80M	5250~5350	1	VHT: 10.22	OFDM
	5470~5725	2	VHT: 14.42	
	5725-5850	1	VHT: 13.87	

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### 1.4 ISED worst power

Wi-Fi 802.11	Frequency Range	Channels	Avg. or EIRP	Rated Power(dBm) (Worst Case)	Modulation Technology
	5150~5250	4	EIRP	21.11	
11a	5250~5350	4	Avg.	16.55	OFDM
11a	5470~5725	12	Avg.	16.16	OFDIVI
	5725-5850	5	Avg.	16.24	
	5150~5250	4	EIRP	HT: 21.61	
11n_HT / ac_VHT	5250~5350	4	Avg.	HT: 15.56	OFDM
20M	5470~5725	12	Avg.	HT: 15.49	OFDM
	5725-5850	5	Avg.	HT: 15.22	
	5150~5250	2	EIRP	HT: 22.79	
11n_HT /	5250~5350	2	Avg.	HT: 15.74	OFDM
ac_VHT 40M	5470~5725	6	Avg.	HT: 15.81	
	5725-5850	2	Avg.	HT: 15.48	
	5150~5250	1	EIRP	20.13	
11ac VHT80M	5250~5350	1	Avg.	10.22	OFDM
	5470~5725	2	Avg.	14.42	
	5725-5850	1	Avg.	13.87	

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## 1.5 Test Methodology of Applied Standards

FCC Part 15, Subpart E §15.407

FCC KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02

FCC KDB 905462 D03 UNII Clients Without Radar Detection New Rules v01r02

RSS-247 issue 2 Feb. 2017

## 1.6 Test Facility

SGS Taiwan Ltd. Central RF Lab (TAF code 3702)

No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803

FCC Designation number: TW0027

ISED CAB identifier: TW3702

### 1.7 Special Accessories

There are no special accessories used while test was conducted.

### **1.8 Equipment Modifications**

There was no modification incorporated into the EUT.

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#### SUMMARY OF TEST RESULT 2

FCC / IC Rules	IC Rules	Description Of Test	Result
§15.407(h)	IC RSS-247 issue 1 $\S6.3$	TPC and DFS Measurement	Compliant

#### **DESCRIPTION OF TEST MODES** 3

Bandwidth and Channel	Test Items	Limit	
	Chanel Move Time	10 sec	
80 MHz 5290 MHz (CH 58)	Channel Closing Transmission time	200ms + aggregate of 60ms over remaining 10 s period	
80 MHz 5530 MHz (CH 106)	Non-Occupancy Period and Client Beacon Test	30 minutes	

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#### MEASUREMENT UNCERTAINTY Δ

Test Items	Uncertainty	
TPC and DFS Measurement	+/- 123.36 Hz	
Temperature	+/- 0.65 °C	
Humidity	+/- 4.6 %	
DC / AC Power Source	DC= +/- 0.13%, AC=+/- 0.2%	

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

The conformity assessment statement in this report is based solely on the test results, measurement uncertainty is excluded.

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#### **TPC AND DFS MEASUREMENT** 5

# 5.1 TPC: Standard Applicable

According to §15.407(h)(1), Transmit power control (TPC). U-NII devices operating in the 5.25-5.35 GHz band and the 5.47-5.725 GHz band shall employ a TPC mechanism. The U-NII device is required to have the capability to operate at least 6 dB below the mean EIRP value of 30 dBm. A TPC mechanism is not required for systems with an e.i.r.p. of less than 500 mW.

Result: N/A, The output power is less than 500mW.

## 5.2 DFS: Standard Applicable

According to §15.407(h)(2) and FCC KDB 905462 D02, Radar Detection Function of Dynamic Frequency Selection (DFS).

Radar Detection Function of Dynamic Frequency Selection (DFS). U-NII devices operating with any part of its 26 dB emission bandwidth in the 5.25-5.35 GHz and 5.47-5.725 GHz bands shall employ a DFS radar detection mechanism to detect the presence of radar systems and to avoid co-channel operation with radar systems. Operators shall only use equipment with a DFS mechanism that is turned on when operating in these bands. The device must sense for radar signals at 100 percent of its emission bandwidth. The minimum DFS detection threshold for devices with a maximum e.i.r.p. of 200 mW to 1 W is -64 dBm. For devices that operate with less than 200 mW e.i.r.p. and a power spectral density of less than 10 dBm in a 1 MHz band, the minimum detection threshold is -62 dBm. The detection threshold is the received power averaged over 1 microsecond referenced to a 0 dBi antenna. For the initial channel setting, the manufacturers shall be permitted to provide for either random channel selection or manual channel selection.

- (i) Operational Modes. The DFS requirement applies to the following operational modes:
  - (a) The requirement for channel availability check time applies in the master operational mode.
  - (b) The requirement for channel move time applies in both the master and slave operational modes.
- (ii) Channel Availability Check Time. A U-NII device shall check if there is a radar system already operating on the channel before it can initiate a transmission on a channel and when it has to move to a new channel. The U-NII device may start using the channel if no radar signal with a power level greater than the interference threshold values listed in paragraph (h)(2) of this section, is detected within 60 seconds.
- Channel Move Time. After a radar's presence is detected, all transmissions shall (iii) cease on the operating channel within 10 seconds. Transmissions during this period shall consist of normal traffic for a maximum of 200 ms after detection of the radar

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signal. In addition, intermittent management and control signals can be sent during the remaining time to facilitate vacating the operating channel.

Non-occupancy Period. A channel that has been flagged as containing a radar sys-(iv) tem, either by a channel availability check or in-service monitoring, is subject to a non-occupancy period of at least 30 minutes. The non-occupancy period starts at the time when the radar system is detected.

According to RSS 247 §6.2.3, Until further notice, devices subject to this section shall not be capable of transmitting in the band 5600-5650 MHz. This restriction is for the protection of Environment Canada's weather radars operating in this band.

According to RSS 247 §6.3, Devices operating in the bands 5250-5350 MHz, 5470-5600 MHz and 5650-5725 MHz band shall comply with the following:

## (a) DFS radar signal detection threshold

Devices shall employ a DFS radar detection mechanism to detect the presence of radar systems and to avoid co-channel operation with radar systems. The device must detect radar signals within its entire emission bandwidth. The minimum DFS radar signal detection threshold is described below.

Devices	DFS Threshold
Devices with an e.i.r.p. < 200 mW AND a Power Spectral Density < 10 dBm/MHz	-62 dBm
Devices with 200 mW $\leq$ e.i.r.p. $\leq$ 1 W	-64 dBm

Note: The detection threshold power is the received power, averaged over a 1-microsecond reference to a 0 dBi antenna.

## (b) Operational requirements

Devices shall comply with the following requirements, however, the requirement for in-service monitoring does not apply to slave devices without radar detection.

- In-service monitoring: an LE-LAN device shall be able to monitor the operating channel (i) to check that a co-channel radar has not moved or started operation within range of the LE-LAN device. During in-service monitoring, the LE-LAN radar detection function continuously searches for radar signals between normal LE-LAN transmissions.
- (ii) Channel availability check time: the device shall check whether there is a radar system already operating on the channel before it initiates a transmission on a channel and when it moves to a channel. The device may start using the channel if no radar signal with a power level greater than the interference threshold value specified in Section 6.3.1 above is detected within 60 seconds. This requirement only applies in the master operational mode.
- (iii) Channel move time: after a radar signal is detected, the device shall cease all transmis-

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sions on the operating channel within 10 seconds.

- (iv) Channel closing transmission time: is comprised of 200 ms 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 ms) over the remaining 10-second period of the channel move time.
- (v) Non-occupancy period: a channel that has been flagged as containing a radar signal, either by a channel availability check or in-service monitoring, is subject to a 30-minute non-occupancy period where the channel cannot be used by the LE-LAN device. The non-occupancy period starts from the time that the radar signal is detected.

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#### 5.2.1 Limit

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

	Operational Mode		
Requirement	Master	Client(without radar detection)	Client(with radar detection)
Non-occupancy Period	Yes	Not required	Yes
DFS Detection Thresh- old	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

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

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Additional requirements for devices with multiple bandwidth mode	Master Device or Client with Radar Detection	Client Without Radar Detection								
U-NII Detection Band- width and Statistical Performance Check	All BW modes must be tested	Not required								
Channel Move Time and Channel Closing Trans- mission 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 in-										
	ithin the radar detection bandw	•								
edge of the radar detection bandwidth. For 802.11 devices it is suggested to select fre- quencies in each of the bonded 20 MHz channels and the channel center frequency.										

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

Maximum Transmit Power	Value
	(See Notes 1, 2, and 3)
$EIRP \ge 200 \text{ milliwatt}$	-64 dBm
EIRP < 200 milliwatt and	-62 dBm
power spectral density < 10 dBm/MHz	
EIRP < 200 milliwatt that do not meet the 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	
transmission waveforms to account for variations in measurement equ	-
test signal is at or above the detection threshold level to trigger a DFS	
Note3: EIRP is based on the highest antenna gain. For MIMO device	es refer to KDB Publication 662911
D01.	

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### Table 4: DFS Response requirement values

Parameter	Value
Non-occupancy period	Minimum 30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds
	See Note 1.
Channel Closing Transmission Time	200 milliseconds + an
_	aggregate of 60
	milliseconds over
	remaining 10 second
	period.
	See Notes 1 and 2.
U-NII Detection Bandwidth	Minimum 100% of the U-
	NII 99% transmission
	power bandwidth. See
	Note 3.

Note 1: Channel Move Time and the Channel Closing Transmission Time should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst.

Note 2: The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required to facilitate a Channel move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.

Note 3: During the U-NII Detection Bandwidth detection test, radar type 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.

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## Table 5: Radar Test Waveforms

## Short Pulse Radar

Radar	Pulse	PRI	Number of Pulses	Minimum	Minimum
Type	Width	(µsec)		Percentage of	Number
	(µsec)			Successful	of
				Detection	Trials
0	1	1428	18	See Note 1	See Note
					1
1	1	Test A: 15 unique	$\left( \begin{pmatrix} 1 \end{pmatrix} \right)$	60%	30
		PRI values	360		
		randomly selected	Roundun		
		from the list of 23	( <u>19.10<sup>6</sup></u> )		
		PRI values in	PRI		
		Table 5a	(( µsec /)		
		Test B: 15 unique			
		PRI values			
		randomly selected			
		within the range			
		of 518-3066 µsec,			
		with a minimum			
		increment of 1			
		µsec, excluding			
		PRI values			
		selected in Test A			
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
	(Radar Types			80%	120
			sed for the detection ba	ndwidth test, ch	annel move
time, and cl	hannel closing	g time tests.			

### Long Pulse Radar

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

### **Frequency Hopping Radar**

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

# The applicant of this given application confirms that information regarding the parameters of the detected Radar Waveforms is not available to the end user.

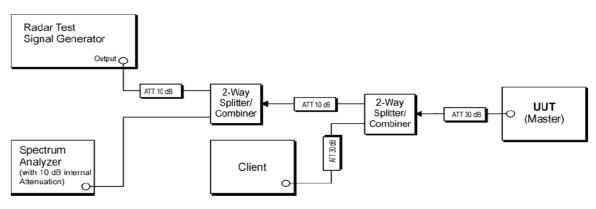
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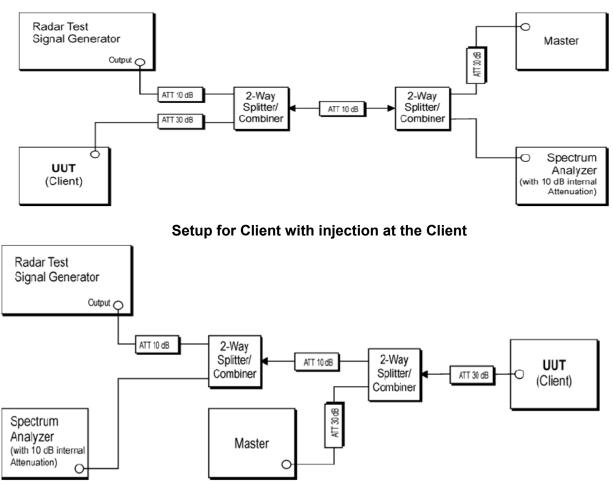


#### 5.2.2 **Test Setup**



Setup for Master with injection at the Master





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		Conducted E	mission Test Site		
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	KEYSIGHT	N9010A	MY57120200	03/06/2019	03/05/2020
Signal Generator	Agilent	N5172B	MY53050661	04/01/2019	03/31/2020
Power Splitter	Mini-Circuits	ZN2PD-9G-S+	N/A	01/05/2019	01/04/2020
Power Splitter	Mini-Circuits	ZN2PD-9G-S+	N/A	01/05/2019	01/04/2020
DC Power Supply	Agilent	E3640A	MY53140006	05/31/2019	05/30/2020
Attenuator	Agilent	8495B	3308A22470	01/05/2019	01/04/2020
Power Splitter	Agilent	11636B	56355	01/05/2019	01/04/2020
Power Splitter	Agilent	11636B	59355	01/05/2019	01/04/2020
Accece Ponit	LINKSYS	WRT3200ACM	1981060B614986 FCC ID:Q87-WRT3200ACM IC:3839A-WRT3200ACM	N/A	N/A

#### 5.2.3 **Test Equipment Used:**

#### 5.2.4 **Description of EUT:**

EUT operates over the 5250-5350MHz and 5470-5725MHz ranges and EUT is a slave device (client equipment) w/o radar detection and DFS capability.

EUT has no TPC mechanism implemented with no adjustment of lowest, and highest power, but the level of power emission stays at fixed level.

WLAN traffic is generated by streaming the mpeg file from the master to slave in full monitor video mode using the media player.

The rated output power of the master unit is >23dBm(EIRP). Therefore, the required interference threshold level is -64dBm. After correction for antenna gain and procedural adjustments, the required conducted threshold at the antenna port is -64dBm.

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While calibrate the path on antenna port of DFS test equipment (master), measurements equipments (spectrum) is ensured to be 50 Ohms, and therefore verification on antenna gain measurement can be ignored.

Conducted test was performed with appropriate adjustment, and calibration to ensure power from DFS simulator injects to antenna port of DFS test equipment (DFS) is -64dBm

## Message or files that is used for communication between Master and Client:

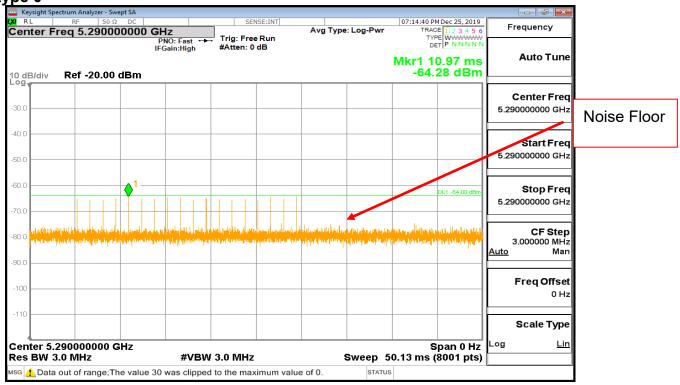
IP based system:

For the required channel loading, the full motion, 30 frames per second MPEG video file from http://ntiacsd.ntia.doc.gov/dfs/ was streamed from a network on a test bench (server of the storage to download the mandatory format of Video file), via the DFS Master device, to the UE (mobile phone).

#### 5.2.5 Test results

# Calibration plots for each of the required radar waveforms 5290MHz

### Radar type 0



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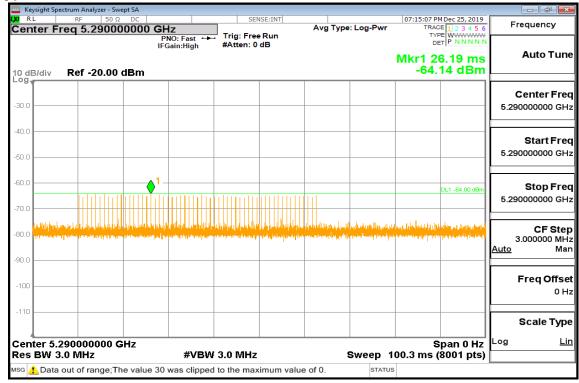
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## Radar type 1 A



### Radar type 1 B



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										ysight Spectrum	
Frequency	M Dec 25, 2019 E 1 2 3 4 5 6 E W W W W W	TRAC	: Log-Pwr	Avg Type			IZ NO: Fast ↔			ter Freq	Cen
Auto Tune	.206 ms 06 dBm	Mkr1 4				#Atten: 0	NO: Fast	IFG	f -20.00 (		10 dE
Center Fred 5.290000000 GHz											-30.0
Start Free 5.290000000 GH											-40.0 -50.0
<b>Stop Fre</b> 5.290000000 GH	DL1 -64.00 dBm				- <b>●</b> <sup>1</sup>						-60.0
<b>CF Ste</b> j 3.000000 MH <u>Auto</u> Ma	and the second	n lande ann					lalan Borna Magaphan Mal	le else stel <sup>l</sup> tel Himi telse be	n a hara na an	nedar ayadda Alertal dag (by ba	-80.0
Freq Offse 0 H											-100
Scale Type	pan 0 Hz 8001 pts)	S 3.000 ms (	Sweep 8			3.0 MHz	#VBW	Hz		ter 5.2900 BW 3.0 N	
<u> </u>			STATUS		imum valu			e value 30		Data out o	

### Radar type 3

										ght Spectrum /	
SENSE:INT         07:16:40 PM Dec 25, 2019           Avg Type: Log-Pwr         TRACE         1 2 3 4 5 6	Avg				lz		DC 000	50 Ω		er Freg (	RL ente
Trig: Free Run #Atten: 0 dB Mkr1 2.950 ms -64.48 dBm				ast ⊶⊶ igh	NO: Fa Gain:Hi	IF	dBn	.00	f -20	div Rel	) dB/
Center Fi 5.29000000 G											0.0 -
Start Fr 5.29000000 G											0.0 -
DL1 -64.00 dBm         Stop Fr           5.290000000 G					1— 1						0.0
					allank Marak	illa ang dalaritid	n an Al	punutu 4 phi phi	hada Halila	Havlares (Halays) Dallfala a sa as fil	
Freq Off											100 -
Scale Ty											110 -
Span 0 Hz N 3.0 MHz Sweep 10.13 ms (8001 pts)	I	/IHz	3.0 r	¢VBW	#		Hz	00 G		r 5.2900 W 3.0 M	
ed to the maximum value of 0.	alue of 0.	maximur	l to the	lipped	was c	lue 30	e va	ie:Th	of rand	Data out of	G 🔥

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											ysight Spectrum	
Frequency	MDec 25, 2019 E 1 2 3 4 5 6 E WWWWWWW	TRAC	: Log-Pwr	Avg Type	Run				50 Ω 000(		ter Freq :	Cen
Auto Tune	.835 ms 13 dBm	Mkr1 1				#Atten: 0	O:Fast ↔ ain:High	IFG	00 d	f -20.		10 dE
Center Free 5.290000000 GH												-30.0
Start Free 5.290000000 GH												-40.0 -50.0
<b>Stop Fre</b> 5.290000000 GH	DL1 -64.00 dBm								<b>•</b> <sup>1</sup>			-60.0
<b>CF Ste</b> j 3.000000 MH <u>Auto</u> Ma		hilasti til bang Antisi hilasi jike	linikalariyalari Mahiriyalariyalari		ortellensenen Nortelense	alati seta aaadi Alk Markinga	a da eda ya a da eda ya	arradau dadu t Lagada adaga y	lon <mark>el el e</mark> l A <sub>el</sub> estar	an anti-	nonalianan Printenan	-80.0
Freq Offse 0 H												-100
Scale Type	pan 0 Hz 8001 pts)		Sween 1			3.0 MHz	#VB14	z	0 GI		ter 5.2900 BW 3.0 M	
		1	STATUS		imum value			value 30 v	e;The		Data out o	

### Radar type 5



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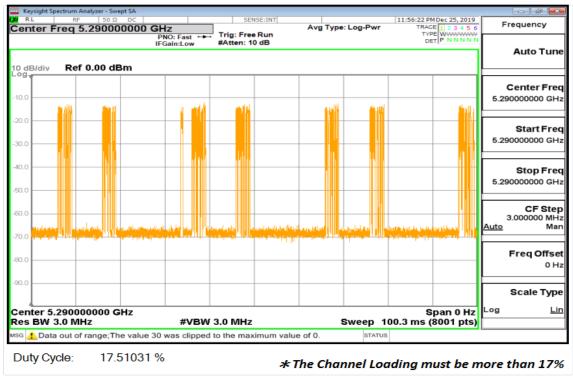
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Keysight Spectrum Anal						
Center Freq 5.2	50 Ω DC 90000000	GHz PNO: Fast ↔	SENSE:INT	Avg Type: Log-Pw	TYPE WWWWWW	+
	0.00 dBm	IFGain:High	#Atten: 0 dB		Mkr1 1.278 ms -64.15 dBm	Auto Tune
-30.0						Center Free 5.290000000 GH
-40.0						Start Free 5.290000000 GH
-60.0	↓1				DL1 -64.00 dBm	<b>Stop Fre</b> 5.290000000 GH
-80.0 (10)(10)(10)(10)(10)(10)(10)(10)(10)(10)				ladapadan dan bergelada p Meneral Janara (Janara) da Jabih	li polet kapal na tuli peta sedi faninge Arling jeg har fere site na jeden pa polete	<b>CF Ste</b> 3.000000 MH <u>Auto</u> Ma
-100						Freq Offse 0 H
Center 5.290000 Res BW 3.0 MHz	000 GHz	#\/B\\/	3.0 MHz	Sween	Span 0 Hz 8.000 ms (8001 pts)	

### WLAN traffic



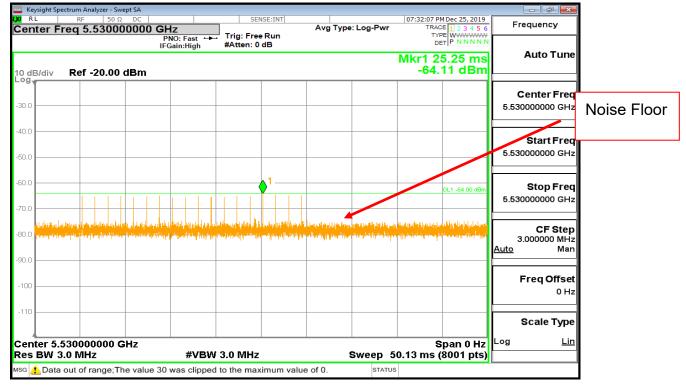
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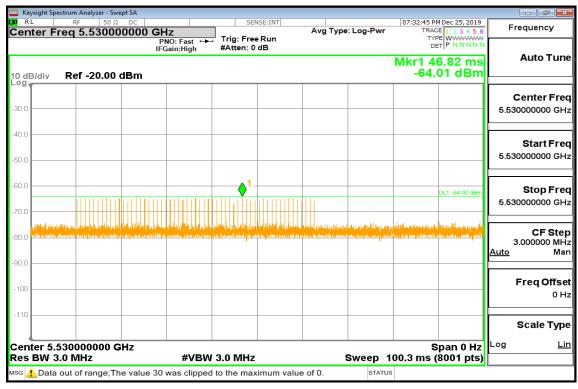
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### 5530MHz Radar type 0



### Radar type 1 A



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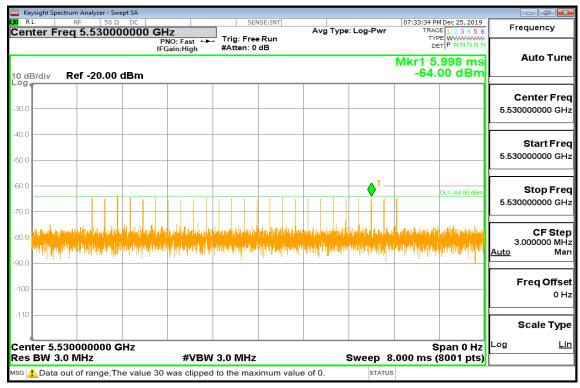
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## Radar type 1 B

Keysight Spectrum Analyzer -					
RL RF 50	000000 GHz PNO: Fast ↔	SENSE:INT	Avg Type: Log-Pwr	07:33:07 PM Dec 25, 2019 TRACE 1 2 3 4 5 6 TYPE WWWWWW	Frequency
10 dB/div Ref -20.0	IFGain:High	#Atten: 0 dB		DET PNNNNN Mkr1 50.11 ms -64.16 dBm	Auto Tun
-30.0					Center Fre 5.530000000 GH
-40.0					Start Fre 5.530000000 G⊦
.60.0				DL1 -64.00 dBm	Stop Fre 5.530000000 G⊦
80.0 patrick and a second s	ere di tida la sua di tata di pada pada di tata di tata di pangalan na da di na mang di patan tang ta ga tang pada da mga tid	na an a	i filma da ini panjara da na populara da na katira. Ini na politika di sebuari populari da populari da katira s	and a line of the second s	CF Ste 3.000000 MH <u>Auto</u> Ma
-100					Freq Offs 0 H
-110					Scale Typ
Center 5.530000000 Res BW 3.0 MHz		V 3.0 MHz	Sweep 1	Span 0 Hz 00.3 ms (8001 pts)	Log <u>Li</u>

### Radar type 2



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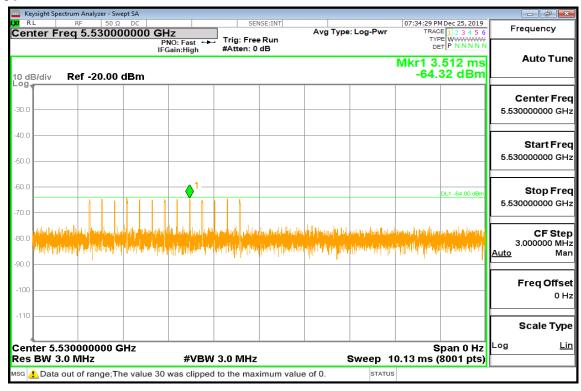
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	ysight Spec		nalyze																											7 <b>×</b>
Cen	L Iter Fr	RF eq 5	5.53	50 S		DC 00(						] <sub>Tri</sub>			SE:IN			Avg	Туре	e: Lo	g-Pwr	•		TRAC TYP	1Dec 25, E 1 2 3 E WWW	456		Fr	equen	су
	B/div	Ref	-20	0.00	dE	3m			J: Fa	ast • ligh			tten:									Ν		5.	471 24 di	ms			Auto	Tune
-30.0																											5		ente 000000	
-40.0 -50.0																											5	5.530	Star	
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### Radar type 4



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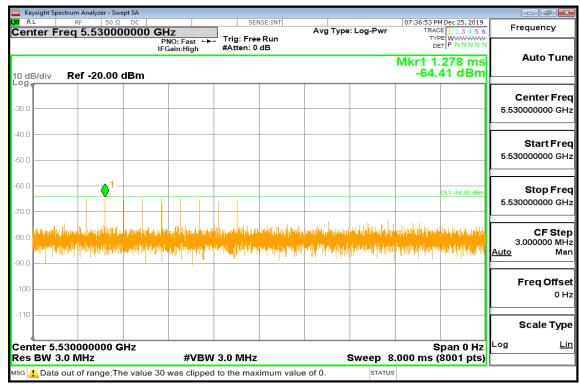
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台灣檢驗科技股份有限公司



RF         50 Ω         DC         SENSE:INT         I07:36:18 PMDec 25,2019         Frequency           Freq 5.530000000 GHz         PN0: Fast         Frig: Free Run         Avg Type: Log-Pwr         Trace [1:2:3:4:5 6         Tree [1:2:3:4:5 6         Frequency           PN0: Fast         Frig: Free Run         #Atten: 0 dB         Avg Type: Log-Pwr         Trace [1:2:3:4:5 6         Auto T           PN0: Fast         Frequency         Trig: Free Run         #Atten: 0 dB         Auto T         Auto T           PRef -20.00 dBm         -0.61 dB         Center F         Center F	
IFGain:High #Atten: 0 dB Auto T Auto T Ref -20.00 dBm -0.61 dB	Freq 5.530000000
Center F	Ref -20.00 dBm
5.53000000	
3 ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	3
Stop F           5.53000000	
3.0 MHz #VBW 3.0 MHz Sweep 15.00 s (8001 pts) 3.000000	5.530000000 GHz / 3.0 MHz
1 t 10.56 s -64.22 dBm	1 t
1 t (Δ) 11.00 s (Δ) -0.61 dB 1 t 2.085 s -64.44 dBm	
Scale T	
- Log	
ta out of range; The value 30 was clipped to the maximum value of 0.	to out of rongo. The web

## Radar type 6

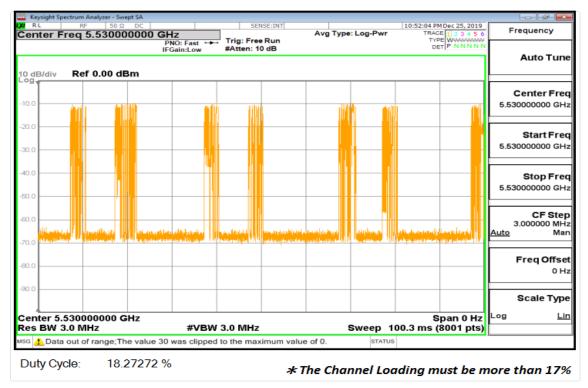


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### WLAN traffic



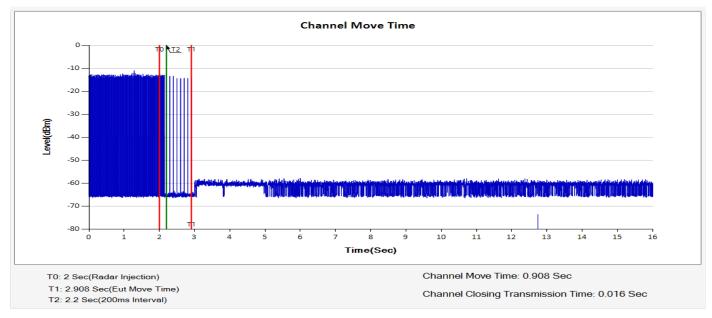
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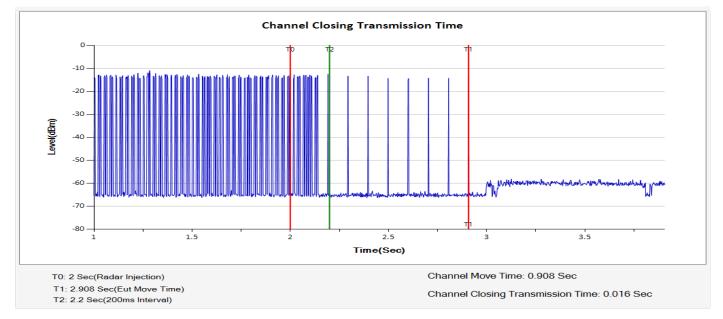
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# 5290 MHz Radar Type 0 Channel Move and Closing Transmission Time – 1



# Radar Type 0 Channel Move and Closing Transmission Time – 2



# Verdict: Note: narrowing the sweep time as the good engineering process for the verification of transmission closing in 200ms

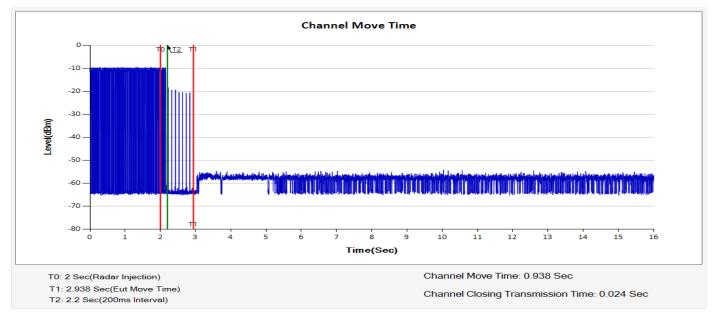
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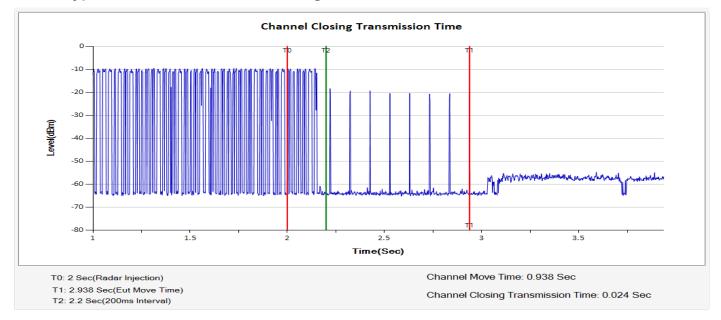
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# 5530MHz Radar Type 0 Channel Move and Closing Transmission Time - 1



# Radar Type 0 Channel Move and Closing Transmission Time - 2



# Verdict: Note: narrowing the sweep time as the good engineering process for the verification of transmission closing in 200ms

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## Non-occupancy Period (without radar detection) 5290MHz

Agilent Spe	ctrum Ar	nalyzer -	Swept SA									
Center	Freq		000000				ISE:INT	Avg T	ALIGNAUTO ype: Log-Pwr	TRAC	M Jun 10, 2020 E 1 2 3 4 5 6 E WWWWWWW	Frequency
10 dB/div	/ Re	f 0.00	dBm	PNO: Fa IFGain:L	ast ↔ .ow	#Atten: 10				<sup>DE</sup> ΔMkr1 1	TPNNNN	Auto Tune
-10.0	×2											Center Freq 5.290000000 GHz
-40.0 -50.0 -60.0						a statute engly	e the Marsa alexa				142	<b>Start Freq</b> 5.290000000 GHz
-70.0 -80.0 -90.0												<b>Stop Freq</b> 5.290000000 GHz
Center Res BW	/ 3.0 N	1Hz	) GHz	#	¢∨BW	3.0 MHz			· · ·	2.000 ks (		CF Step 3.000000 MHz Auto Man
MKE         MODE           1         ∆2           2         F           3         4           5         6           7         8           9         10           11         11		(Δ)	×	1.800 k 96.75		-38.98 ( -24.63 dE	dB	NCTION	FUNCTION WIDTH	FUNCTIC	N VALUE	Freq Offset
MSG									STATU	is		

### 5530MHz



# Verdict: To verify whether channel is unavailable to be operated in 30 minutes. 1.8ks = 1800s = 1800 s/min /60 = 30minute

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~ End of Report ~

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