

# FCC Test Report (Class II Permissive Change)

Product Name	NPort Device Server
Model No	NPort W2250A,NPort W2150A,NPort W2250A-T,NPort W2150A-T
FCC ID	SLE-W2X50A

Applicant	MOXA Inc.
Address	FL.4, NO. 135. LANE 235, BAOQIAO RD. XINDIAN
	DIST.,NEW TAIPEI CITY, TAIWAN

Date of Receipt	Mar. 14, 2016
Issued Date	Apr. 08, 2016
Report No.	1630271R-RFUSP47V00
Report Version	V1.0



The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration of the equipment and evaluated measurement uncertainty herein.

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# Test Report

Issued Date: Apr. 08, 2016 Report No.: 1630271R-RFUSP47V00



Product Name	NPort Device Server		
Applicant	MOXA Inc.		
	FL.4, NO. 135. LANE 235, BAOQIAO RD. XINDIAN DIST.,NEW		
Address	TAIPEI CITY, TAIWAN		
Manufacturer	MOXA Inc.		
Model No.	NPort W2250A,NPort W2150A,NPort W2250A-T,NPort W2150A-T		
FCC ID.	SLE-W2X50A		
EUT Rated Voltage	AC 110~230V, DC 24V		
EUT Test Voltage	AC 120V/60Hz		
Trade Name	MOXA		
Applicable Standard	FCC CFR Title 47 Part 15 Subpart E: 2014		
	ANSI C63.4: 2014, ANSI C63.10: 2013		
	789033 D02 General UNII Test Procedures New Rules v01r01		
Test Result	Complied		
Documented By	Joanne lin		
	(Senior Adm. Specialist / Joanne Lin)		
Tested By	Bill Lin		
	(Engineer / Bill Lin)		
Approved By	Hand		
	(Director / Vincent Lin)		



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## 1. GENERAL INFORMATION

## **1.1. EUT Description**

Product Name	NPort Device Server
Trade Name	MOXA
FCC ID.	SLE-W2X50A
Model No.	NPort W2250A,NPort W2150A,NPort W2250A-T,NPort W2150A-T
Frequency Range	802.11a: 5745-5805MHz
Number of Channels	802.11a: 4
Data Rate	802.11a: 6-54Mbps
Type of Modulation	802.11a:OFDM, BPSK, QPSK, 16QAM, 64QAM
Channel Control	Auto
Antenna type	Dipole Antenna
Antenna Gain	Refer to the table "Antenna List"

#### Antenna List

No.	Manufacturer	Part No.	Antenna type	Peak Gain
1	KINSUN	6602D03081	Dipole	1.73dBi for 5GHz

Note: The antenna of EUT is conform to FCC 15.203.

802.11a Center Working Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 149:	5745 MHz	Channel 153:	5765 MHz	Channel 157:	5785 MHz	Channel 161:	5805 MHz

Note:

- 1. This device is a NPort Device Server with a built-in WLAN transceiver.
- 2. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
- 3. Lowest and highest data rates are tested in each mode. Only worst case is shown in the report. (802.11a is 6Mbps)
- 4. These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15 Subpart E for Unlicensed National Information Infrastructure devices.
- 5. The different of the two model is shown as below:

Model Number	Description	
NPort W2250A,NPort W2150A	Without extreme temperatures	
NPort W2250A-T,NPort W2150A-T	With extreme temperatures	

6. This is requesting a Class II permissive change for FCC ID: SLE-W2X50A. Originally granted on 05/30/2012.

The differences are listed as below:

Change # 1: Original grant compliance are following old rule of UNII requirements, changed to meet the requirements of the new rules.

Change # 2: Change the appearance of the product (All other hardware is identical with original granted).

Test Mode	Mode 1: Transmit (802.11a-6Mbps)
Test Mode	Mode 1: Iransmit (802.11a-6Mbps)



#### **1.3.** Tested System Datails

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product		Manufacturer	Model No.	Serial No.	Power Cord
1	Notebook PC	DELL	Latitude E5440	HG26TZ1	Non-Shielded, 0.8m

	Signal Cable Type	Signal cable Description		
А	LAN Cable	Non-Shielded, 2m		

#### 1.4. Configuration of tested System



#### **1.5.** EUT Exercise Software

- (1) Setup the EUT and peripherals as shown in section 1.4.
- (2) Execute "Putty v0.63" program on the Notebook PC.
- (3) Configure the test mode, the test channel, and the data rate.
- (4) Start the continuous transmission.
- (5) Verify that the EUT works properly.

#### 1.6. Test Facility

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	20-35
Humidity (%RH)	25-75	50-65
Barometric pressure (mbar)	860-1060	950-1000

Ambient conditions in the laboratory:

The related certificate for our laboratories about the test site and management system can be downloaded from QuieTek Corporation's Web Site : <u>http://www.quietek.com/chinese/about/certificates.aspx?bval=5</u>

The address and introduction of QuieTek Corporation's laboratories can be founded in our Web site : <a href="http://www.quietek.com/">http://www.quietek.com/</a>

Site Description:	File on					
	Federal Communications Commission					
	FCC Engineering Laboratory					
	7435 Oakland Mills Road					
	Columbia, MD 21046					
	Registration Number: 92195					
Site Name:	Quietek Corporation					
Site Address:	No.5-22, Ruishukeng, Linkou Dist.,					
	New Taipei City 24451,					
	Taiwan, R.O.C.					
	TEL: 886-2-8601-3788 / FAX : 886-2-8601-3789					
	E-Mail : <u>service@quietek.com</u>					

FCC Accreditation Number: TW1014

## 2. Conducted Emission

#### 2.1. Test Equipment

	Equipment	Manufacturer	Model No. / Serial No.	Last Cal.	Remark				
Х	Test Receiver	R & S	ESCS 30 / 825442/018	Sep., 2015					
Х	Artificial Mains Network	R & S	ENV4200 / 848411/10	Feb., 2016	Peripherals				
Х	LISN	R & S	ESH3-Z5 / 825562/002	Feb., 2016	EUT				
	DC LISN	Schwarzbeck	8226 / 176	Mar., 2016	EUT				
Х	Pulse Limiter	R & S	ESH3-Z2 / 357.8810.52	Feb., 2016					
	No.1 Shielded Room								

Note:

- 1. All equipments are calibrated every one year.
- 2. The test instruments marked by "X" are used to measure the final test results.

#### 2.2. Test Setup



#### 2.3. Limits

FCC Part 15 Subpart C Paragraph 15.207 (dBµV ) Limit								
Frequency	Limits							
MHz	QP	AV						
0.15 - 0.50	66-56	56-46						
0.50-5.0	56	46						
5.0 - 30	60	50						

Remarks : In the above table, the tighter limit applies at the band edges.

#### 2.4. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm /50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement.

Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

The EUT was setup to ANSI C63.4, 2014; tested to UNII test procedure of FCC KDB-789033 for compliance to FCC 47CFR Subpart E requirements.

#### 2.5. Uncertainty

± 2.26 dB

## 2.6. Test Result of Conducted Emission

Product	:	NPort Device Server
Test Item	:	Conducted Emission Test
Power Line	:	Line 1
Test Mode	:	Mode 1: Transmit (802.11a-6Mbps) (5745MHz)

Frequency	Correct	Reading	Reading Measurement		Limit
	Factor	Level	Level		
MHz	dB	dBµV	dBµV	dB	dBμV
LINE 1					
Quasi-Peak					
0.170	9.778	45.860	55.639	-9.790	65.429
0.216	9.776	40.110	49.886	-14.228	64.114
0.431	9.783	31.180	40.963	-17.008	57.971
1.071	9.842	26.440	36.282	-19.718	56.000
2.711	9.949	24.070	34.019	-21.981	56.000
15.721	10.163	11.650	21.813	-38.187	60.000
Average					
0.170	9.778	33.400	43.179	-12.250	55.429
0.216	9.776	28.630	38.406	-15.708	54.114
0.431	9.783	25.300	35.083	-12.888	47.971
1.071	9.842	20.420	30.262	-15.738	46.000
2.711	9.949	18.280	28.229	-17.771	46.000
15.721	10.163	6.060	16.223	-33.777	50.000

Note:

- 1. All Reading Levels are Quasi-Peak and average value.
- 2. "means the worst emission level.
- 3. Measurement Level = Reading Level + Correct Factor

Product	:	NPort Device Server							
Test Item	:	Conducted Emission Test							
Power Line	:	Line 2							
Test Mode	:	Mode 1: Tran	smit (802.11a	-6Mbps) (5745MH	z)				
Frequency		Correct	Reading	Measureme	nt Margin	Limit			
		Factor	Level	Level					
MHz		dB	dBµV	dBµV	dB	dBµV			
LINE 2									
Quasi-Peak									
0.170		9.832	45.880	55.712	-9.717	65.429			
0.216		9.836	40.210	50.046	-14.068	64.114			
0.384		9.849	32.490	42.339	-16.975	59.314			
0.642		9.869	27.570	37.439	-18.561	56.000			
3.115		10.026	22.780	32.806	-23.194	56.000			
5.875		10.100	18.470	28.570	-31.430	60.000			
Average									
0.170		9.832	33.200	43.032	-12.397	55.429			
0.216		9.836	28.630	38.466	-15.648	54.114			
0.384		9.849	29.670	39.519	-9.795	49.314			
0.642		9.869	22.670	32.539	-13.461	46.000			
3.115		10.026	17.010	27.036	-18.964	46.000			
5.875		10.100	12.380	22.480	-27.520	50.000			

#### Note:

- 1. All Reading Levels are Quasi-Peak and average value.
- 2. "means the worst emission level.
- 3. Measurement Level = Reading Level + Correct Factor



#### 3. Maximun conducted output power

#### 3.1. Test Equipment

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
Х	Power Meter	Anritsu	ML2495A/6K00003357	May, 2015
Х	Power Sensor	Anritsu	MA2411B/0738448	Jun., 2015
Х	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2016
Note				

1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

2. The test instruments marked with "X" are used to measure the final test results.

#### 3.2. Test Setup

#### 26dBc Occupied Bandwidth



#### Conduction Power Measurement (for 802.11an)



#### **Conduction Power Measurement (for 802.11ac)**



#### 3.3. Limits

(1) For the band 5.15-5.25 GHz,

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. Fixed point-topoint U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

- (2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm 10 log B, where B is the 26 dB emission bandwidth in megahertz. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
- (3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point UNII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.



#### **3.4.** Test Procedure

As an alternative to FCC KDB-789033, the EUT maximum conducted output power was measured with an average power meter employing a video bandwidth greater the 6dB BW of the emission under test. Maximum conducted output power was read directly from the meter across all data rates, and across three channels within each sub-band. Special care was used to make sure that the EUT was transmitting in continuous mode. This method exceeds the limitations of FCC KDB-789033, and provides more accurate measurements.

802.11an (BW  $\leq$  40MHz) Maximum conducted output power using KDB 789033 section E)3)b) Method PM-G (Measurement using a gated RF average power meter) <u>Note: the power meter have a video bandwidth that is greater than or equal to the measurement</u> <u>bandwidth, (Anritsu/MA2411B video bandwidth: 65MHz)</u>

802.11ac (BW=80MHz) Maximum conducted output power using KDB 789033 section E)2)b) Method SA-1 (trace averaging with the EUT transmitting at full power throughout each sweep).

When transmitted signals consist of two or more non-contiguous spectrum segments (e.g., 80+80 MHz mode) or when a single spectrum segment of a transmission crosses the boundary between two adjacent U-NII bands, KDB 644545 D01 section F) procedure is used for measurements.

#### 3.5. Uncertainty

 $\pm$  1.27 dB



## **3.6.** Test Result of Maximum conducted output power

Product	:	NPort Device Server
Test Item	:	Maximum conducted output power
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmit (802.11a-6Mbps)

Cable loss=1dB		Maximum conducted output power								
		Data Rate (Mbps)								
Channel No.	Frequency (MHz)	6	9	12	18	24	36	48	54	Required Limit
			Measurement Level (dBm)							
149	5745	13.35								<30dBm
157	5785	15.59	15.51	15.43	15.35	15.27	15.19	15.11	15.03	<30dBm
161	5805	13.21								<30dBm

Note: Maximum conducted output power Value =Reading value on average power meter + cable loss

#### Maximum conducted output power Measurement:

Channel Number	Frequency	26dB Bandwidth	Output Power	Output Power Limit
	(MHz)	(dBm)	(dBm)	(dBm)
149	5745		13.35	30
157	5785		15.59	30
161	5805		13.21	30

Note:

1. Power Output Value =Reading value on average power meter + cable loss

## 4. Peak Power Spectral Density

## 4.1. Test Equipment

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun., 2015
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun., 2015
Х	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2016
NT /				

Note:

1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

2. The test instruments marked with "X" are used to measure the final test results.

#### 4.2. Test Setup



#### 4.3. Limits

(1) For the band 5.15-5.25 GHz,

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. Fixed point-topoint U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations. (iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.+

- (2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
- (3) For the band 5.725-5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point UNII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

#### 4.4. Test Procedure

The EUT was setup to ANSI C63.10: 2013; tested to UNII test procedure of FCC KDB-789033 for compliance to FCC 47CFR Subpart E requirements.

The Peak Power Spectral Density using KDB 789033 section F) procedure, Create an average power spectrum for the EUT operating mode being tested by following the instructions in section E)2) for measuring maximum conducted output power using a spectrum analyzer.

SA-1 method is selected to run the test.

Scale the observed power level to an equivalent value in 500 kHz by adjusting (increase) the measured power by a bandwidth correction factor (BWCF) where  $BWCF = 10\log (500 \text{ kHz}/100 \text{ kHz}) = 6.98 \text{ dB}.$ 

#### 4.5. Uncertainty

± 1.27 dB

## 4.6. Test Result of Peak Power Spectral Density

Product	:	NPort Device Server
Test Item	:	Peak Power Spectral Density
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmit (802.11a-6Mbps)

Channel Number	Frequency (MHz)	Data Rata (Mbps)	PPSD (dBm)	BWCF (dB)	Total PPSD (dBm)	Required Limit (dBm)	Result
149	5745	6	-7.92	6.98	-0.94	<30	Pass
157	5785	6	-7.36	6.98	-0.38	<30	Pass
161	5805	6	-9.45	6.98	-2.47	<30	Pass

Agiler	t Spectru	m Analyzer - Sw	ept SA								
الار Cen	ter Fre	RF 50 Ω eq 5.74500	AC 0000 GH	łz		NSE:INT	#Avg Type	ALIGN AUTO E: RMS	02:25:15 P	M Mar 21, 2016	Frequency
10 di	3/div	Ref Offset 0.5 Ref 20.50 (	P IFI 5 dB <b>1Bm</b>	NO: Fast 🕞 Gain:Low	7 Trig: Free #Atten: 30	⊧Run )dB		Mkr1	5.740 C -7.	92 dBm	Auto Tune
10.5											Center Freq 5.745000000 GHz
0.500 -9.50		M		1	vvvvvv		wwwww	ᠮᢦᢦᢦᢦᢦᢦᡁ	M		<b>Start Freq</b> 5.732500000 GHz
-19.5 -29.5									h		<b>Stop Freq</b> 5.757500000 GHz
-39.5	Noo W	and the second							~~	Mun John of	CF Step 2.500000 MHz <u>Auto</u> Man
-49.5											Freq Offset 0 Hz
-69.5 Cen	ter 5.74	4500 GHz		#)(P)4	200 kH-			Swoon 3	Span 2	5.00 MHz	
#RC MSG	5011	UU KHZ		#VDW	JUU KHZ			status	. 155 MS (	1001 pts)	

#### Channel 149:



								pt SA	nalyzer - Swe	t Spectrum A	Agilen
Frequency	4 Mar 21, 2016 E 1 2 3 4 5 6 E A WWWWW	02:27:05 PM TRAC TYP	ERMS	#Avg Typ	Run	SEM	lz N0: Fast ⊊	AC 0000 GH PI	5.78500	ter Freq	Cen
Auto Tune	50 GHz 36 dBm	5.780 3 -7.3	Mkr1		I dB	#Atten: 30	Gain:Low	dB Bm	ef Offset 0.5 ef 20.50 d	Re Bidiv <b>R</b> e	10 dE
Center Freq 5.785000000 GHz											Log 10.5
<b>Start Freq</b> 5.772500000 GHz		VV	WWW	ᢣ᠕᠕᠕᠕	mm	www			<u>^v</u>		0.500 -9.50
<b>Stop Freq</b> 5.797500000 GHz		- La Contra			1	)					-19.5 -29.5
CF Step 2.500000 MHz Auto Man	mont	v,							√* 	m	-39.5
Freq Offset 0 Hz											-59.5
	5.00 MHz 1001 pts)	Span 2 .133 ms (	Sweep 3			300 kHz	#VBW		00 GHz ) kHz	ter 5.785 s BW 100	-69.5 Cent
	,		STATUS								MSG

#### Channel 157:

Channel 161:

Agilent Spec	trum Analyzer - Swe	ept SA								
Center F	RF 50 Ω Freq 5.80500	AC   00000 GH	z		ISE:INT	#Avg Type	ALIGN AUTO e: RMS	02:28:33 PM TRAC	4 Mar 21, 2016 E 1 2 3 4 5 6	Frequency
10 dB/div	Ref Offset 0.5 Ref 20.50 (	Pi IFC 5 dB <b>1Bm</b>	NO: Fast 😱 Gain:Low	#Atten: 30	dB		Mkr1	5.801 9 -9.	00 GHz 45 dBm	Auto Tune
10.5										Center Freq 5.805000000 GHz
0.500 -9.50		M	↓ <sup>1</sup> www.	MMM	MMM	www	www	M		<b>Start Freq</b> 5.792500000 GHz
-19.5					]					<b>Stop Freq</b> 5.817500000 GHz
-39.5	Maler word							North Contraction	Marmon V	<b>CF Step</b> 2.500000 MHz <u>Auto</u> Man
-59.5										Freq Offset 0 Hz
-69.5 Center 5	.80500 GHz							Span 2	5.00 MHz	
#Res BW	/ 100 kHz		#VBW	300 kHz		:	Sweep 3	.133 ms (	1001 pts)	



## 5. Radiated Emission

#### 5.1. Test Equipment

The following test equipments are used during the radiated emission test:

Test Site	Equipment		Manufacturer	Model No./Serial No.	Last Cal.
Site # 3	Х	Magnetic Loop Antenna	Teseq	HLA6121/ 37133	Sep., 2015
	X Bilog Antenna		Schaffner Chase	CBL6112B/ 2707	Jun., 2015
	Х	EMI Test Receiver	R&S	ESCS 30/838251/ 001	Jun., 2015
	Х	Coaxial Cable	QTK(Arnist)	RG 214/ LC003-RG	Jun., 2015
	X	Coaxial signal switch	Arnist	MP59B/ 6200798682	Jun., 2015

Test Site		Equipment	Manufacturer	Model No./Serial No.	Last Cal.
CB # 8	X Spectrum Analyzer		R&S	FSP40/ 100339	Oct., 2015
	Х	Horn Antenna	ETS-Lindgren	3117/ 35205	Mar., 2016
	X Horn Antenna		Schwarzbeck BBHA9170/209		Jan., 2016
	Х	Horn Antenna	TRC	AH-0801/95051	Aug., 2015
	X Pre-Amplifier		EMCI	EMC012630SE/980210	Jan., 2016
	Х	Pre-Amplifier	MITEQ	JS41-001040000-58-5P/153945	Jul., 2015
	X	Pre-Amplifier	NARDA	DBL-1840N506/013	Jul., 2015

Note: 1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

2. The test instruments marked with "X" are used to measure the final test results.



#### 5.2. Test Setup

Radiated Emission Below 1GHz



Radiated Emission Above 1GHz





#### 5.3. Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

FCC Part 15 Subpart C Paragraph 15.209(a) Limits								
Frequency MHz	Field strength	Measurement distance						
11112	(microvolts/meter)	(meter)						
0.009-0.490	2400/F(kHz)	300						
0.490-1.705	24000/F(kHz)	30						
1.705-30	30	30						
30-88	100	3						
88-216	150	3						
216-960	200	3						
Above 960	500	3						

Remarks: E field strength  $(dB\mu V /m) = 20 \log E$  field strength (uV/m)

#### 5.4. Test Procedure

The EUT was setup according to ANSI C63.10, 2013 and tested according to FCC KDB-789033 test procedure for compliance to FCC 47CFR 15. 407 requirements.

Measuring the frequency range below 1GHz, the EUT is placed on a turn table which is 0.8 meter above ground, when measuring the frequency range above 1GHz, the EUT is placed on a turn table which is 1.5 meter above ground.

The turn table is rotated 360 degrees to determine the position of the maximum emission level.

The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned between 1 meter and 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10: 2013 on radiated measurement.

The resolution bandwidth below 30MHz setting on the field strength meter is 9kHz and 30MHz~1GHz is 120kHz and above 1GHz is 1MHz.

Radiated emission measurements below 30MHz are made using Loop Antenna and 30MHz~1GHz are made using broadband Bilog antenna and above 1GHz are made using Horn Antennas.

The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with the measurement antenna kept pointed at the source of the emission both in azimuth and elevation, with the polarization of the antenna oriented for maximum response. The antenna is pointed at an angle towards the source of the emission, and the EUT is rotated in both height and polarization to maximize the measured emission. The emission is kept within the illumination area of the 3 dB bandwidth of the antenna. The worst radiated emission is measured in the Open Area Test Site on the Final Measurement. The measurement frequency range form 9kHz - 10th Harmonic of fundamental was investigated.

#### 5.5. Uncertainty

- ± 3.8 dB below 1GHz
- ± 3.9 dB above 1GHz

#### 5.6. Test Result of Radiated Emission

Product	:	NPort Device Server
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmit (802.11a-6Mbps) (5745MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBµV	$dB\mu V/m$	dB	$dB\mu V/m$
Horizontal					
<b>Peak Detector:</b>					
11490.000	17.106	31.940	49.047	-24.953	74.000
17235.000	*	*	*	*	74.000
20720.000	*	*	*	*	74.000
25900.000	*	*	*	*	74.000
31080.000	*	*	*	*	74.000
36260.000	*	*	*	*	74.000
Average					
<b>Detector:</b>					
*	*	*	*	*	54.000
Vertical					
Peak Detector:					
11490.000	18.034	32.470	50.505	-23.495	74.000
17235.000	*	*	*	*	74.000
20720.000	*	*	*	*	74.000
25900.000	*	*	*	*	74.000
31080.000	*	*	*	*	74.000
36260.000	*	*	*	*	74.000
Average					
<b>Detector:</b>					
*	*	*	*	*	54.000

Note:

- 1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. Measurement Level = Reading Level + Correct Factor.
- 5. Correct Factor = Antenna factor + Cable loss Amplifier gain.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.
- 7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product	: NPort Device Server							
Test Item	: Harmon	: Harmonic Radiated Emission Data						
Test Site	: No.3 O	ATS						
Test Mode	: Mode 1	: Transmit (802.1)	la-6Mbps) (5785MHz	2)				
Frequency	Correct	Reading	Measurement	Margin	Limit			
	Factor	Level	Level					
MHz	dB	dBµV	dBµV /m	dB	$dB\mu V/m$			
Horizontal								
Peak Detector:								
11570.000	16.809	31.840	48.649	-25.351	74.000			
17355.000	*	*	*	*	74.000			
20800.000	*	*	*	*	74.000			
26000.000	*	*	*	*	74.000			
31200.000	*	*	*	*	74.000			
36400.000	*	*	*	*	74.000			
Average								
<b>Detector:</b>								
*	*	*	*	*	54.000			
Vertical								
Peak Detector:								
11570.000	17.698	31.520	49.218	-24.782	74.000			
17355.000	*	*	*	*	74.000			
20800.000	*	*	*	*	74.000			
26000.000	*	*	*	*	74.000			
31200.000	*	*	*	*	74.000			
36400.000	*	*	*	*	74.000			
Average								
<b>Detector:</b>								
*	*	*	*	*	54.000			

Note:

- 1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. Measurement Level = Reading Level + Correct Factor.
- 5. Correct Factor = Antenna factor + Cable loss Amplifier gain.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.
- 7. The emission levels of other frequencies are very lower than the limit and not show in test report.

54.000

Draduat

Floduct	. NFOILL	evice Server				
Test Item	: Harmonic Radiated Emission Data					
Test Site	: No.3 OATS					
Test Mode	: Mode 1	Transmit (802.1	la-6Mbps) (5805MHz	z)		
Frequency	Correct	Reading	Measurement	Margin	Limit	
	Factor	Level	Level			
MHz	dB	dBµV	$dB\mu V/m$	dB	$dB\mu V/m$	
Horizontal						
Peak Detector:						
11610.000	16.554	32.080	48.633	-25.367	74.000	
17475.000	*	*	*	*	74.000	
20960.000	*	*	*	*	74.000	
26200.000	*	*	*	*	74.000	
31440000	*	*	*	*	74.000	
36680.000	*	*	*	*	74.000	
Average						
<b>Detector:</b>						
*	*	*	*	*	54.000	
Vertical						
<b>Peak Detector:</b>						
11610.000	17.460	31.970	49.430	-24.570	74.000	
17475.000	*	*	*	*	74.000	
20960.000	*	*	*	*	74.000	
26200.000	*	*	*	*	74.000	
31440000	*	*	*	*	74.000	
36680.000	*	*	*	*	74.000	
Average						
Detector:						

Note:

\*

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.

\*

\*

2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.

MDart Davias Comus

3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.

\*

4. Measurement Level = Reading Level + Correct Factor.

\*

5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.

6. The average measurement was not performed when the peak measured data under the limit of average detection.

7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product	: NPort Device Server							
Test Item	: General Radiated Emission							
Test Site	: No.3 OATS	: No.3 OATS						
Test Mode	: Mode 1: Tra	ansmit (802.11a-6	Mbps) (5785MHz)					
Frequency	Correct	Reading	Measurement	Margin	Limit			
	Factor	Level	Level					
MHz	dB	dBµV	$dB\mu V/m$	dB	$dB\mu V/m$			
Horizontal								
<b>Peak Detector</b>								
287.261	-4.621	43.356	38.735	-7.265	46.000			
354.739	-2.501	44.931	42.429	-3.571	46.000			
509.377	1.292	37.725	39.017	-6.983	46.000			
642.928	1.436	38.133	39.569	-6.431	46.000			
710.406	3.595	35.918	39.513	-6.487	46.000			
820.058	5.836	33.278	39.114	-6.886	46.000			
Vertical								
<b>Peak Detector</b>								
243.681	-8.450	45.671	37.221	-8.779	46.000			
309.754	-6.835	43.687	36.852	-9.148	46.000			
443.304	-8.228	45.494	37.266	-8.734	46.000			
509.377	-0.143	43.307	43.164	-2.836	46.000			
665.420	-1.866	43.169	41.304	-4.696	46.000			
820.058	3.332	37.119	40.451	-5.549	46.000			

Note:

- 1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. Measurement Level = Reading Level + Correct Factor.
- 5. Correct Factor = Antenna factor + Cable loss Amplifier gain.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.
- 7. The emission levels of other frequencies are very lower than the limit and not show in test report.
- 8. No emission found between lowest internal used/generated frequency to 30MHz.



#### 6. Band Edge

#### 6.1. **Test Equipment**

#### **RF Radiated Measurement:**

The following test equipments are used during the band edge tests:

Test Site		Equipment	Manufacturer	Model No./Serial No.	Last Cal.
⊠CB # 8	Х	Spectrum Analyzer	R&S	FSP40/ 100339	Oct., 2015
	Х	Horn Antenna	ETS-Lindgren	3117/ 35205	Mar., 2016
	X Horn Antenna X Horn Antenna X Pre-Amplifier		Schwarzbeck	BBHA9170/209	Jan., 2016
			TRC	AH-0801/95051	Aug., 2015
			EMCI	EMC012630SE/980210	Jan., 2016
	Х	Pre-Amplifier	MITEQ	JS41-001040000-58-5P/153945	Jul., 2015
	Х	Pre-Amplifier	NARDA	DBL-1840N506/013	Jul., 2015

Note: 1. All instruments are calibrated every one year.

2. The test instruments marked by "X" are used to measure the final test results.



#### 6.2. Test Setup

#### **RF Radiated Measurement:**



#### 6.3. Limits

The provisions of Section 15.205 of this part apply to intentional radiators operating under this section.

Radiated emissions which fall in the restricted bands, as defined in Section 15.205, must also comply with the radiated emission limits specified in Section 15.209:

FCC Part 15 Subpart C Paragraph 15.209 Limits					
Frequency MHz	uV/m @3m	dBµV/m@3m			
30-88	100	40			
88-216	150	43.5			
216-960	200	46			
Above 960	500	54			

Remarks : 1. RF Voltage ( $dB\mu V$ ) = 20 log RF Voltage (uV)

- 2. In the Above Table, the tighter limit applies at the band edges.
- 3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

#### 6.4. Test Procedure

The EUT is placed on a turn table which is 1.5 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.10:2013 on radiated measurement.

The bandwidth below 1GHz setting on the field strength meter is 120 kHz, above 1GHz are 1 MHz. The EUT was setup to ANSI C63.10, 2013; tested to UNII test procedure of FCC KDB-789033 for compliance to FCC 47CFR Subpart E requirements.

#### 6.5. Uncertainty

- ± 3.8 dB below 1GHz
- $\pm$  3.9 dB above 1GHz



## 6.6. Test Result of Band Edge

Product	:	NPort Device Server
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmit (802.11a-6Mbps)-Channel 149

#### **RF Radiated Measurement:**



	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Measure Level (dBµV /m)	Margin (dB)	Limit (dBµV/m)	Result
Horizontal	5712.826	4.651	44.327	48.978	-19.242	68.220	Pass
Horizontal	5715.000	4.652	44.231	48.883	-19.337	68.220	Pass
Horizontal	5725.000	4.654	48.360	53.014	-25.206	78.220	Pass
Horizontal	5740.942	4.655	83.963	88.619	10.399	78.220	Pass



	Frequency	Correct Factor	Reading Level	Measure Level	Margin	Limit	Result
	(MHz)	(dB)	(dBµV)	$(dB\mu V/m)$	(dB)	$(dB\mu V/m)$	
Vertical	5713.986	5.994	55.278	61.272	-6.948	68.220	Pass
Vertical	5715.000	5.994	54.588	60.582	-7.638	68.220	Pass
Vertical	5725.000	5.992	62.720	68.713	-9.507	78.220	Pass
Vertical	5741.377	5.990	95.997	101.987	23.767	78.220	Pass



Product	:	NPort Device Server
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmit (802.11a-6Mbps)-Channel 161

#### **RF Radiated Measurement:**



	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Measure Level (dBµV/m)	Margin (dB)	Limit (dBµV /m)	Result
Horizontal	5801.014	4.688	81.840	86.527	8.307	78.220	Pass
Horizontal	5850.000	4.964	42.015	46.979	-31.241	78.220	Pass
Horizontal	5850.435	4.966	44.539	49.505	-28.715	78.220	Pass
Horizontal	5860.000	5.023	44.364	49.387	-18.833	68.220	Pass



	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Result
Vertical	5801.014	5.980	92.070	98.050	19.830	78.220	Pass
Vertical	5850.000	6.037	43.789	49.826	-28.394	78.220	Pass
Vertical	5855.942	6.043	43.812	49.855	-28.365	78.220	Pass
Vertical	5860.000	6.047	42.517	48.564	-19.656	68.220	Pass
Vertical	5878.986	6.069	44.490	50.559	-17.661	68.220	Pass

## 7. Occupied Bandwidth

#### 7.1. Test Equipment

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun., 2015
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun., 2015
Х	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2016
<b>ЪТ</b> /				

Note:

1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

2. The test instruments marked with "X" are used to measure the final test results.

#### 7.2. Test Setup



#### 7.3. Limits

For the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz

#### 7.4. .Test Procedure

The EUT was setup to ANSI C63.10, 2013; tested to UNII test procedure of FCC KDB-789033 for compliance to FCC 47CFR Subpart E requirements.

#### 7.5. Uncertainty

± 150Hz



## 7.6. Test Result of Occupied Bandwidth

Product	:	NPort Device Server
Test Item	:	Occupied Bandwidth Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmit (802.11a-6Mbps) (5745MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
149	5745.00	16150	>500	Pass

Figure	Channel	149:
<b>.</b>		

Agiler	nt Spec	strun	n Ana	alyzer - Swe	pt SA								
Cen	ter	Fre	RF eq (	50 Ω 5.74500	AC 0000 GH	łz	SEI		Avg Type	ALIGNAUTO : Log-Pwr	02:24:55 P	M Mar 21, 2016	Frequency
10 d	PNU: Fast → Ingention Kall IFGain:Low #Atten: 30 dB Ref Offset 0.5 dB 0 dB/div Ref 20.50 dBm -5.50 dBm									Auto Tune			
Log 10.5 0.500 -9.50						2 lan	1 mmmmlmm	andround	mundant 3			-5.07 dBm	Center Freq 5.745000000 GHz
-19.5 -29.5 -39.5	in AMA	MM	avat.	phalla mi	Mannaharand	Arrend .			v	Wesner with whith	White years and	WALLAND	<b>Start Freq</b> 5.720000000 GHz
-49.5 -59.5 -69.5													<b>Stop Freq</b> 5.770000000 GHz
Cen #Re	ter : s B\	5.74 N 1	150 00	0 GHz kHz		#VBI	W 300 kHz			Sweep 4	Span 5 .800 ms (	0.00 MHz 1001 pts)	CF Step 5.000000 MHz Auto Man
1 2 3 4 5 6 7 8 9 10 11 <	MUDE N N	1 1 1			× 5.736 8 5.753 0	5 GHz 5 GHz 0 GHz	Y 0.93 dl -5.50 dl -5.53 dl	3m 3m 3m 			FUNCIU		Freq Offset 0 Hz
MSG										STATUS	;		<u>[]</u>



Product	:	NPort Device Server
Test Item	:	Occupied Bandwidth Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmit (802.11a-6Mbps) (5785MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
157	5785.00	16150	>500	Pass

#### Figure Channel 157:

Agiler	nt Spe	ctrun	n Ana	alyzer - Swe	ept SA										
Cen	L Iter	Fre	RF q (	50 Ω	AC 00000 G	Hz		SEI	NSE:INT	Avg	Гуре	ALIGNAUTO : Log-Pwr	02:26:45 P TRA	M Mar 21, 2016 CE 1 2 3 4 5 6 PE M MANANAN	Frequency
10 d	Ref Offset 0.5 dB 10 dB (db) AB (db)									Auto Tune					
Log 10.5 0.500 -9.50						•	2 <	1 millionthrownhow	ul milina	hand and and a	3			-4.44 dBm	Center Freq 5.785000000 GHz
-19.5 -29.5 -39.5	hall	ለኩጥዖ	, naka	Warmphad	In market	and a					L Voy	wayalagea (m. 1919)	Merrinder	Woll With -	Start Freq 5.76000000 GHz
-49.5 -59.5 -69.5															<b>Stop Freq</b> 5.81000000 GHz
Cen #Re	ter s Bl	5.78 N 1	350 00	0 GHz kHz		#	VBN	( 300 kHz			ş	Sweep 4	Span 5 800 ms (	0.00 MHz 1001 pts)	CF Step 5.000000 MHz
1 2 3 4 5 6 7 8 9 10 11 <			SCL f f		× 5.780 5.776 5.793	05 GHz 85 GHz 00 GHz		Y 1.56 dl -4.62 dl -5.34 dl	3m 3m 3m 3m		FUN		FUNCTI		Freq Offset 0 Hz
MSG												STATUS			



Product	:	NPort Device Server
Test Item	:	Occupied Bandwidth Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmit (802.11a-6Mbps) (5805MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
161	5805.00	16450	>500	Pass

## Figure Channel 161:

Agilen	nt Spectr	um Ar	alyzer - Sv	vept SA								
Cen	ter Fi	RF eq	50 s 5.8050	2 AC	Hz	SEI		Avg Type	ALIGNAUTO :: Log-Pwr	02:28:13 P TRA	M Mar 21, 2016 E 1 2 3 4 5 6	Frequency
10 di	B/div	Re' Re	f Offset 0 f 20.50	.5 dB dBm	NO: Fast 🕞 Gain:Low	#Atten: 3	D dB		Mkr	2 5.796 -8.	80 GHz 47 dBm	Auto Tune
Log 10.5 0.500 -9.50					2-	al washer all washer	nim him	mehrel 3			-6.53 dBm	Center Freq 5.805000000 GHz
-19.5 -29.5 -39.5	Kana I mala	yntru	-AM Maryley Do	Wangleson the strend	Karred .			- Ver	www.www.wl.an	Antrody . Mr May	Mounter	<b>Start Freq</b> 5.780000000 GHz
-49.5 -59.5 -69.5	<u>11-47</u>											<b>Stop Freq</b> 5.830000000 GHz
Cen #Re	ter 5.3 s BW	3050 100	0 GHz kHz	×	#VBV	V 300 kHz	FUN	TION FUN	Sweep 4	Span 5 .800 ms (	0.00 MHz 1001 pts)	<b>CF Step</b> 5.000000 MHz <u>Auto</u> Man
1 2 3 4 5	N 1 N 1 N 1	f f f		5.807 5 5.796 8 5.813 2	50 GHz 30 GHz 25 GHz	-0.53 dl -8.47 dl -8.85 dl	3m 3m 3m					Freq Offset 0 Hz
8 9 10 11												
< MSG									STATUS	5		

#### 8. Frequency Stability

#### 8.1. Test Equipment

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.	
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun., 2015	
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun., 2015	
Х	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2016	
<b>N</b> T /					

Note:

1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

2. The test instruments marked with "X" are used to measure the final test results.

#### 8.2. Test Setup



#### 8.3. Limits

Manufactures of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified

#### 8.4. Test Procedure

The EUT was setup to ANSI C63.10, 2013; tested to UNII test procedure of FCC KDB-789033 for compliance to FCC 47CFR Subpart E requirements.

#### 8.5. Uncertainty

± 150 Hz

## 8.6. Test Result of Frequency Stability

Product	:	NPort Device Server
Test Item	:	Frequency Stability
Test Site	:	Temperature Chamber
Test Mode	:	Carrier Wave

Test Co	onditions	Channel	Frequency (MHz)	Frequency (MHz)	△F (MHz)
		149	5745.0000	5745.0036	-0.0036
Tnom (20) °C	Vnom (110)V	157	5785.0000	5785.0032	-0.0032
		161	5805.0000	5805.0085	-0.0085
		149	5745.0000	5745.0035	-0.0035
Tmax (50) °C	Vmax (126.5)V	157	5785.0000	5785.0031	-0.0031
		161	5805.0000	5805.0031	-0.0031
		149	5745.0000	5745.0022	-0.0022
Tmax (50) °C	Vmin (93.5)V	157	5785.0000	5785.0063	-0.0063
		161	5805.0000	5805.0024	-0.0024
		149	5745.0000	5745.0850	-0.0850
Tmin (0) °C	Vmax (126.5)V	157	5785.0000	5785.0062	-0.0062
		161	5805.0000	5805.0074	-0.0074
Tmin (0) °C		149	5745.0000	5745.0014	-0.0014
	Vmin (93.5)V	157	5785.0000	5785.0023	-0.0023
		161	5805.0000	5805.0074	-0.0074



## 9. EMI Reduction Method During Compliance Testing

No modification was made during testing.



Attachment 1: EUT Test Photographs



## **Attachment 2: EUT Detailed Photographs**