

# **FCC Test Report**

Product Name	Tablet PC	
Model No	TU10MK, TF10MK1, Ty10MKx(y=0~9, A~Z	
	or blank or "-", x=0~9, A~Z or blank or "-")	
FCC ID	WL6-TU1MT63MK1	

Applicant	ELITEGROUP COMPUTER SYSTEMS CO., LTD
Address	No.239, Sec. 2, Ti Ding Blvd., Taipei, Taiwan

Date of Receipt	Dec. 15, 2017
Issued Date	Jan. 26, 2018
Report No.	17C0206R-RFUSP60V00
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 report of the equipment and evaluated measurement uncertainty herein.

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Applicant	ELITEGROUP COMPUTER SYSTEMS CO., LTD	
Address	No.239, Sec. 2, Ti Ding Blvd., Taipei, Taiwan	
Manufacturer	ELITEGROUP COMPUTER SYSTEMS CO., LTD	
M - 1-1 N -	TU10MK, TF10MK1, Ty10MKx(y=0~9, A~Z or blank or "-", x=0~9,	
Model No.	A~Z or blank or "-")	
FCC ID.	WL6-TU1MT63MK1	
EUT Rated Voltage	AC 100-240V, 50-60Hz or DC 3.7V(Power by battery)	
EUT Test Voltage	AC 120V/60Hz	
Trade Name	ECS ELITEGROUP	
Applicable Standard	FCC CFR Title 47 Part 15 Subpart E: 2016	
	ANSI C63.4: 2014, ANSI C63.10: 2013	
	789033 D02 General UNII Test Procedures New Rules v02	
Test Result	Complied	

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Approved By	:	Hand S
		( Director / Vincent Lin )



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Attachment 1: EUT Test Photographs
Attachment 2: EUT Detailed Photographs



# 1. GENERAL INFORMATION

# 1.1. EUT Description

Product Name	Tablet PC
Trade Name	ECS ELITEGROUP
FCC ID.	WL6-TU1MT63MK1
Model No.	TU10MK, TF10MK1, Ty10MKx(y=0~9, A~Z or blank or "-", x=0~9, A~Z or blank or "-")
Frequency Range	802.11a/n-20MHz: 5180-5240MHz, 5745-5825MHz
Number of Channels	802.11a/n-20MHz: 9
Data Rate	802.11a: 6-54Mbps
	802.11n: up to 72.2Mbps
Channel Control	Auto
Type of Modulation	OFDM, BPSK, QPSK, 16QAM, 64QAM
Antenna Type	PIFA Antenna
Antenna Gain	Refer to the table "Antenna List"
Power Adapter	MFR: Asian, M/N:WB-10E05R
	Input:100-240V~50-60Hz, 0.4A
	Output:5V==, 2A
	Cable Out Non-shielded, 1.5m

# Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	WGT	13-130-JL5050	PIFA Antenna	2.89 dBi for 5.150-5.250 GHz
				2.94 dBi for 5.725-5.850 GHz

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



# 802.11a/n-20MHz Center Working Frequency of Each Channel:

Channel Frequency Channel Frequency Channel Frequency Channel Frequency Channel 36: 5180 MHz Channel 40: 5200 MHz Channel 44: Channel 48: 5240 MHz 5220 MHz Channel 149: 5745 MHz Channel 153: 5765 MHz Channel 157: 5785 MHz Channel 161: 5805 MHz

Channel 165: 5825 MHz

- 1. This device is a Tablet PC with a built-in WLAN and Bluetooth V4.0 \ V2.1+EDR transceiver, the test report is for 5GHz WLAN.
- 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 \ 802.11n(20M-BW) is 7.2Mbps)
- 4. These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance of 802.11a/n-20 transmitter with Part 15 Subpart E for Unlicensed National Information Infrastructure devices.
- 5. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.

Test Mode	Mode 1: Transmit (802.11a-6Mbps)
	Mode 2: Transmit (802.11n-20BW 7.2Mbps)



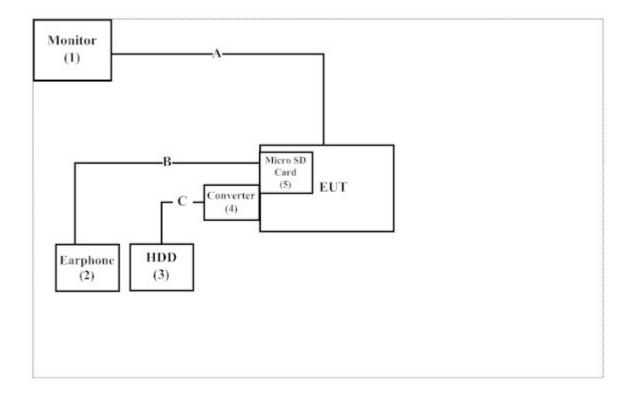
# **1.3.** Tested System Datails

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

Prod	uct	Manufacturer	Model No.	Serial No.	Power Cord
1	Monitor	DELL	U2415	CN-01RMGX-74261-6	Non-shielded, 1.8m
				3H-09UL-A02	
2	Earphone	Verbatim	N/A	N/A	N/A
3	USB 3.0	WD	WDBUZG0010	WX11A166S2Y3	N/A
			BBK-PESN		
4	Converter	N/A	N/A	N/A	N/A
	(MicorUSB to USB)				
5	Micro SD Card	Sandisk	32GB	N/A	N/A

Signal Cable Type		Signal cable Description
A	Micro HDMI to HDMI Cable	Shielded, 1.8m
В	Earphone Cable	Non-shielded, 1m
С	USB Cable	Shielded, 0.3m

# 1.4. Configuration of tested System





# 1.5. EUT Exercise Software

- 1. Setup the EUT as shown in Section 1.4.
- 2. Execute software "MT6571 va.6C.2" on the EUT.
- 3. Configure the test mode, the test channel, and the data rate.
- 4. Press "OK" to start the continuous Transmit.
- 5. Verify that the EUT works properly.



# 1.6. Test Facility

Ambient conditions in the laboratory:

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

The related certificate for our laboratories about the test site and management system can be downloaded from DEKRA Testing and Certification Co., Ltd. Web Site:

http://www.dekra.com.tw/english/about/certificates.aspx?bval=5

The address and introduction of DEKRA Testing and Certification Co., Ltd. laboratories can be founded in our Web site: <a href="http://www.dekra.com.tw/index\_en">http://www.dekra.com.tw/index\_en</a>

Site Description: Accredited by TAF

Accredited Number: 3023

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FCC Accreditation Number: TW3023



# 1.7. List of Test Equipment

### For Conduction measurements /ASR1

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Data	Due. Data
X	EMI Test Receiver	R&S	ESR7	101602	2017.12.11	2018.12.10
X	Two-Line V-Network	R&S	ENV216	101306	2017.02.16	2018.02.15
X	Two-Line V-Network	R&S	ENV216	101307	2017.03.17	2018.03.16
X	Coaxial Cable	Quietek	RG400_BNC	RF001	2017.05.24	2018.05.23

#### Note:

- 1. All equipments are calibrated every one year.
- 2. The test instruments marked with "X" are used to measure the final test results.
- 3. Test Software version: QuieTek EMI 2.0 V2.1.113

### For Conducted measurements /ASR4

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Data	Due. Data
X	Spectrum Analyzer	R&S	FSV30	103466	2017.12.19	2018.12.18
X	Power Meter	Anritsu	ML2496A	1548003	2017.12.11	2018.12.10
X	Power Sensor	Anritsu	MA2411B	1531024	2017.12.11	2018.12.10
X	Power Sensor	Anritsu	MA2411B	1531025	2017.12.11	2018.12.10

### Note:

- 1. All equipments are calibrated every one year.
- 2. The test instruments marked with "X" are used to measure the final test results.
- 3. Test Software version : QuieTek Conduction Test System V8.0.110

### For Radiated measurements /ACB1

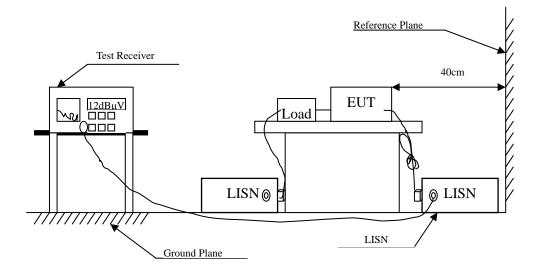
	Equipment	Manufacturer	Model No.	Serial No.	Cali. Data	Due. Data
X	Loop Antenna	TESEQ	HLA6121	37133	2016.03.18	2018.03.17
X	Bi-Log Antenna	SCHWARZBECK	VULB9168	9168-674	2017.02.13	2018.02.12
X	Horn Antenna	ETS-Lindgren	3117	00203800	2017.11.10	2018.11.09
X	Horn Antenna	Com-Power	AH-840	101087	2017.05.24	2018.05.23
X	Pre-Amplifier	EMCI	EMC001330	980316	2017.05.16	2018.05.15
X	Pre-Amplifier	EMCI	EMC051835SE	980311	2017.05.17	2018.05.16
X	Pre-Amplifier	EMCI	EMC05820SE	980310	2017.05.17	2018.05.16
X	Pre-Amplifier	EMCI	EMC184045SE	980314	2017.05.17	2018.05.16
	Filter	MICRO TRONICS	BRM50702	G251	2017.08.30	2018.08.29
X	Filter	MICRO TRONICS	BRM50716	G188	2017.08.30	2018.08.29
X	EMI Test Receiver	R&S	ESR7	101602	2017.12.11	2018.12.10
X	Spectrum Analyzer	R&S	FSV40	101147	2018.01.11	2019.01.10
X	Coaxial Cable	SUHNER	SUCOFLEX 106	RF002	2017.05.25	2018.05.24
X	Mircoflex Cable	HUBER SUHNER	SUCOFLEX 102	MY3381/2	2017.08.11	2018.08.10

- 1. Loop Antenna is calibrated every two year, the other equipments are calibrated every one year.
- 2. The test instruments marked with "X" are used to measure the final test results.
- 3. Test Software version : QuieTek EMI 2.0 V2.1.113



### 2. Conducted Emission

# 2.1. Test Setup



# 2.2. 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.



#### 2.3. 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 C63.4:2014 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.

### 2.4. Uncertainty

±2.35dB



# 2.5. Test Result of Conducted Emission

Product : Tablet PC

Test Item : Conducted Emission Test

Power Line : Line 1

Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5180MHz)

Test Date : 2018/01/18

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	$dB\mu V$	$dB\mu V$	dB	dΒμV
LINE 1					_
Quasi-Peak					
0.152	9.616	39.013	48.629	-17.314	65.943
0.202	9.680	31.442	41.122	-23.392	64.514
0.411	9.694	25.150	34.844	-23.699	58.543
2.661	9.769	34.810	44.579	-11.421	56.000
11.087	9.956	30.345	40.301	-19.699	60.000
24.576	10.100	27.644	37.744	-22.256	60.000
Average					
0.152	9.616	18.126	27.742	-28.201	55.943
0.202	9.680	19.616	29.296	-25.218	54.514
0.411	9.694	14.102	23.796	-24.747	48.543
2.661	9.769	26.936	36.704	-9.296	46.000
11.087	9.956	21.137	31.093	-18.907	50.000
24.576	10.100	25.390	35.490	-14.510	50.000

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



Test Item : Conducted Emission Test

Power Line : Line 2

Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5180MHz)

Test Date : 2018/01/18

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dΒμV	dΒμV	dB	dΒμV
LINE 2					
Quasi-Peak					
0.161	9.628	35.897	45.526	-20.160	65.686
0.208	9.680	28.032	37.712	-26.631	64.343
0.674	9.704	24.528	34.233	-21.767	56.000
2.630	9.766	33.874	43.640	-12.360	56.000
11.184	9.962	29.508	39.470	-20.530	60.000
24.576	10.140	26.528	36.668	-23.332	60.000
Average					
0.161	9.628	17.843	27.472	-28.214	55.686
0.208	9.680	17.870	27.550	-26.793	54.343
0.674	9.704	17.687	27.391	-18.609	46.000
2.630	9.766	26.358	36.124	-9.876	46.000
11.184	9.962	20.113	30.075	-19.925	50.000
24.576	10.140	23.534	33.674	-16.326	50.000

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



Test Item : Conducted Emission Test

Power Line : Line 1

Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5785MHz)

Test Date : 2018/01/18

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dΒμV	dΒμV	dB	dΒμV
LINE 1					
Quasi-Peak					
0.152	9.616	38.215	47.831	-18.112	65.943
0.168	9.652	34.112	43.765	-21.721	65.486
2.312	9.758	30.835	40.593	-15.407	56.000
2.692	9.774	35.319	45.093	-10.907	56.000
11.112	9.956	30.518	40.474	-19.526	60.000
18.319	10.056	16.053	26.109	-33.891	60.000
Average					
0.152	9.616	21.233	30.849	-25.094	55.943
0.168	9.652	15.195	24.848	-30.638	55.486
2.312	9.758	24.015	33.773	-12.227	46.000
2.692	9.774	27.352	37.126	-8.874	46.000
11.112	9.956	20.422	30.378	-19.622	50.000
18.319	10.056	7.593	17.649	-32.351	50.000

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



Test Item : Conducted Emission Test

Power Line : Line 2

Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5785MHz)

Test Date : 2018/01/18

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dΒμV	dΒμV	dB	dΒμV
LINE 2					
Quasi-Peak					
0.152	9.607	38.389	47.996	-17.947	65.943
0.175	9.663	33.891	43.554	-21.732	65.286
0.672	9.703	24.549	34.252	-21.748	56.000
2.679	9.775	34.185	43.960	-12.040	56.000
11.137	9.961	30.010	39.971	-20.029	60.000
24.322	10.140	20.452	30.592	-29.408	60.000
Average					
0.152	9.607	19.629	29.236	-26.707	55.943
0.175	9.663	16.660	26.323	-28.963	55.286
0.672	9.703	17.725	27.428	-18.572	46.000
2.679	9.775	26.403	36.178	-9.822	46.000
11.137	9.961	19.236	29.197	-20.803	50.000
24.322	10.140	15.837	25.977	-24.023	50.000

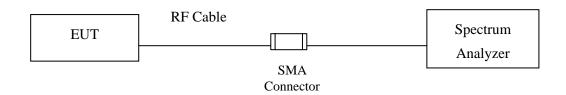
- 1. All Reading Levels are Quasi-Peak and average value.
- 2. "means the worst emission level.
- 3. Measurement Level = Reading Level + Correct Factor



# 3. Maximun conducted output power

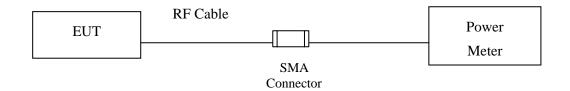
# 3.1. Test Setup

# 99% Occupied Bandwidth

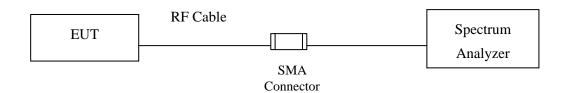


### **Conduction Power Measurement**

Conduction Power Measurement (for 802.11an)



Conduction Power Measurement (for 802.11ac)





#### 3.2. Limits

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.

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 99% 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.



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.

### 3.3. 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 ≤ 40MHz) Maximum conducted output power using KDB 789033 section E)3)b) Method PM-G (Measurement using a gated RF average power meter)

Note: the power meter have a video bandwidth that is greater than or equal to the measurement bandwidth, (Anritsu/ MA2411B video bandwidth: 65MHz)

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 D03 section D) procedure is used for measurements.

### 3.4. Uncertainty

Power Meter: ±0.95dB

Spectrum Analyzer: ±1.30dB



# 3.5. Test Result of Maximum conducted output power

Product : Tablet PC

Test Item : Maximum conducted output power Test Mode : Mode 1: Transmit (802.11a-6Mbps)

Test Date : 2018/01/17

Cabl	Cable loss=1.5dB		Maximum conducted output power						
			Data Rate (Mbps)						
Channel No.	Frequency (MHz)	6	9	12	18	24	36	48	54
			Measurement Level (dBm)						
36	5180	11.61							
44	5220	11.43	11.38	11.33	11.27	11.24	11.20	11.16	11.11
48	5240	11.67							
149	5745	11.63							
157	5785	11.77	11.72	11.68	11.63	11.58	11.52	11.48	11.43
165	5825	11.42							

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

**Maximum conducted output power Measurement:** 

Channel No	Frequency Range	99% Bandwidth	Output Power	Output Power Limit	
	(MHz)	(MHz)	(dBm)	(dBm)	dBm+10log(BW)
36	5180		11.61	24	
44	5220		11.43	24	
48	5240		11.67	24	
149	5745		11.63	30	
157	5785		11.77	30	
165	5825		11.42	30	



Test Item : Maximum conducted output power

Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps)

Test Date : 2018/01/17

Cabl	Cable loss=1.5dB			Maximum conducted output power					
	Frequency (MHz)		Data Rate (Mbps)						
Channel No.		7.2	14.4	21.7	28.9	43.3	57.8	65	72.2
		Measurement Level (dBm)							
36	5180	11.22							
44	5220	11.66	11.61	11.57	11.52	11.47	11.42	11.38	11.34
48	5240	11.43							
149	5745	11.21							
157	5785	11.32	11.28	11.22	11.17	11.13	11.08	11.04	10.99
165	5825	11.68							

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

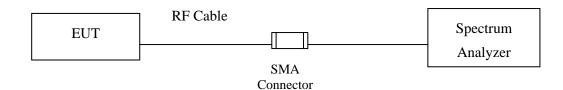
**Maximum conducted output power Measurement:** 

Channel No	Frequency Range	99% Bandwidth	Output Power	Output Po	ower Limit
	(MHz)	(MHz)	(dBm)	(dBm)	dBm+10log(BW)
36	5180		11.22	24	
44	5220		11.66	24	
48	5240		11.43	24	
149	5745		11.21	30	
157	5785		11.32	30	
165	5825		11.68	30	



### 4. Peak Power Spectral Density

### 4.1. Test Setup



#### 4.2. Limits

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.+

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.



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.

### 4.3. 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.

For the band 5.725-5.85 GHz, 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  $BWCF = 10\log (500 \text{ kHz}/100 \text{ kHz}) = 6.98 \text{ dB}$ .

### 4.4. Uncertainty

±1.30dB



# 4.5. Test Result of Peak Power Spectral Density

Product : Tablet PC

Test Item : Peak Power Spectral Density

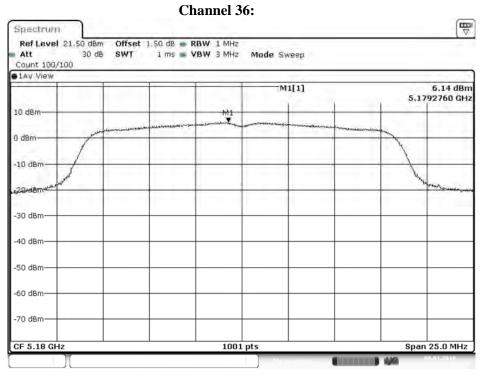
Test Mode : Mode 1: Transmit (802.11a-6Mbps)

Test Date : 2018/01/08

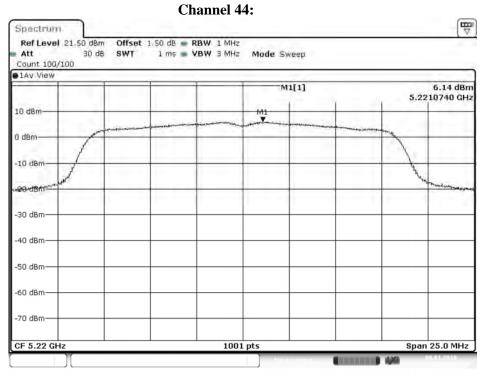
Channel Number	Frequency (MHz)	Data Rata (Mbps)	Measurement Level (dBm)	Required Limit (dBm)	Result
36	5180	6	6.140	<11	Pass
44	5220	6	6.140	<11	Pass
48	5240	6	6.210	<11	Pass

Channel Number	Frequency (MHz)	Data Rata (Mbps)	PPSD (dBm)	BWCF (dB)	Total PPSD (dBm)	Required Limit (dBm)	Result
149	5745	6	-2.720	6.980	4.260	<30	Pass
157	5785	6	-2.400	6.980	4.580	<30	Pass
165	5825	6	-2.280	6.980	4.700	<30	Pass

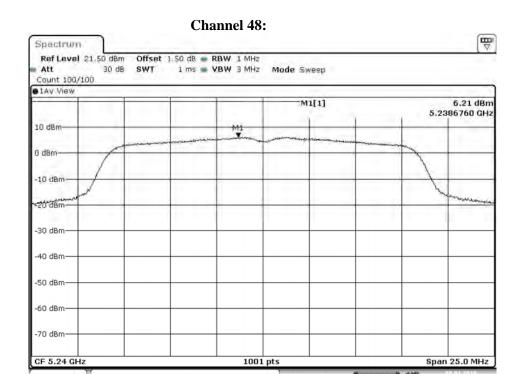




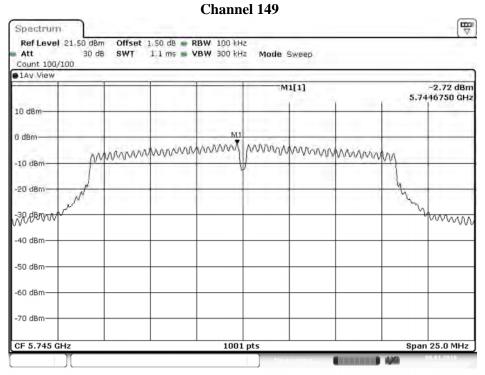
Date: 8.JAN.2018 15:22:18





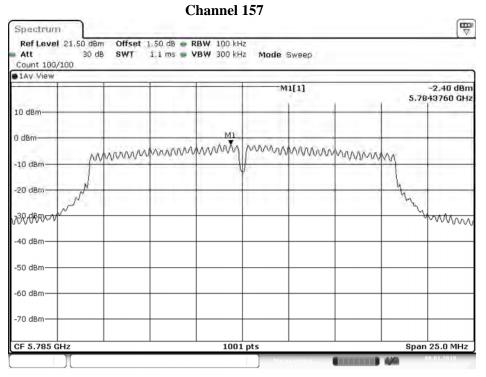


Date: 8.JAN.2018 15:27:32

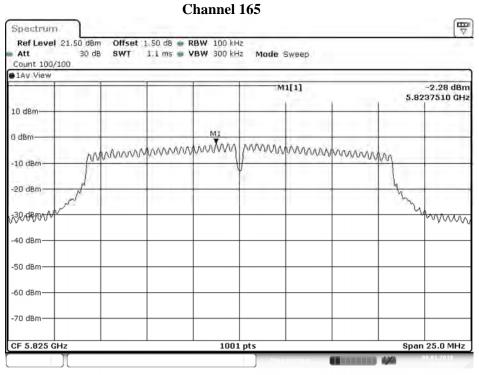


Date: 8.JAN.2018 15:35:37





Date: 8.JAN.2018 15:37:47



Date: 8.JAN.2018 15:39:52



Test Item : Peak Power Spectral Density

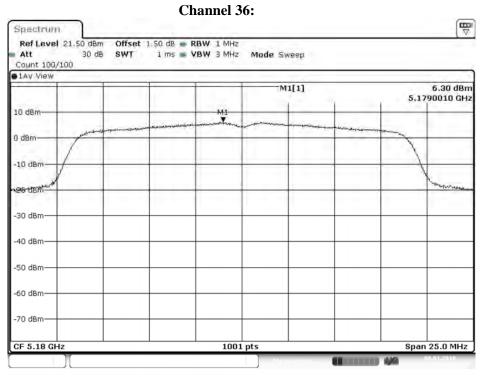
Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps)

Test Date : 2018/01/08

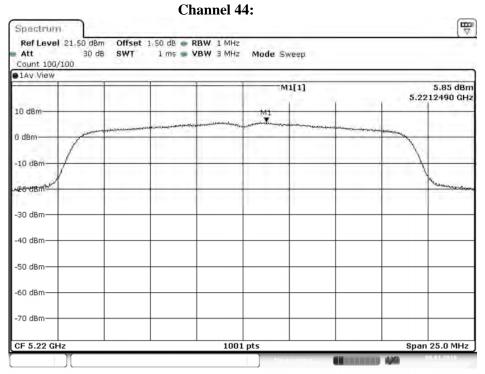
Channel Number	Frequency (MHz)	Data Rata (Mbps)	Measurement Level (dBm)	Required Limit (dBm)	Result
36	5180	7.2	6.300	<11	Pass
44	5220	7.2	5.850	<11	Pass
48	5240	7.2	5.650	<11	Pass

Channel Number	Frequency (MHz)	Data Rata (Mbps)	PPSD (dBm)	BWCF (dB)	Total PPSD (dBm)	Required Limit (dBm)	Result
149	5745	7.2	-2.330	6.980	4.650	<30	Pass
157	5785	7.2	-2.540	6.980	4.440	<30	Pass
165	5825	7.2	-2.670	6.980	4.310	<30	Pass



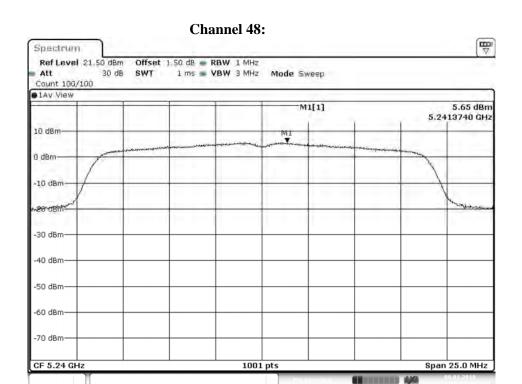


Date: 8.JAN.2018 15:29:30

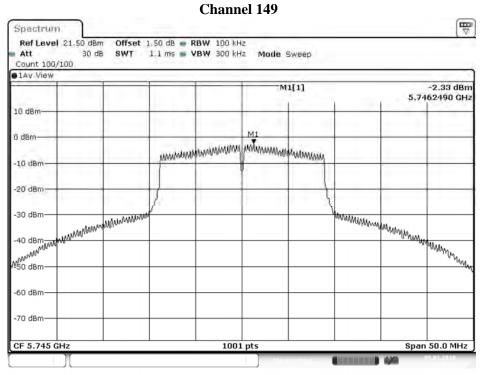


Date: 8.JAN.2018 15:31:13



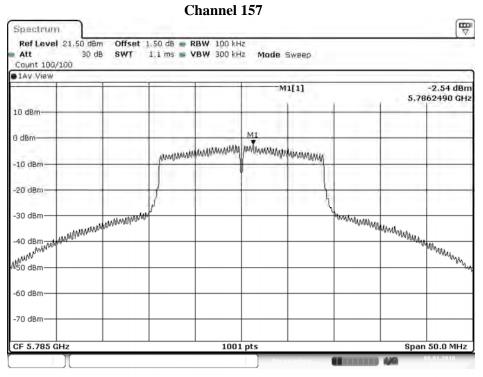


Date: 8.JAN.2018 15:32:47

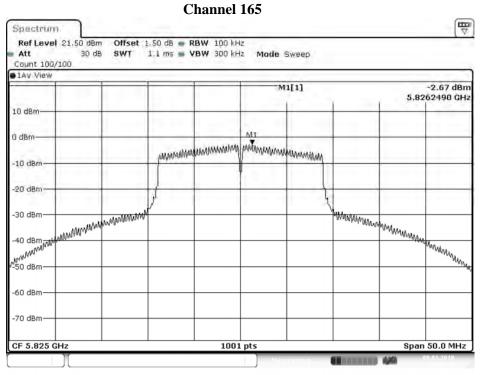


Date: 8.JAN.2018 15:42:36





Date: 8.JAN.2018 15:45:02



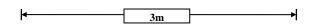
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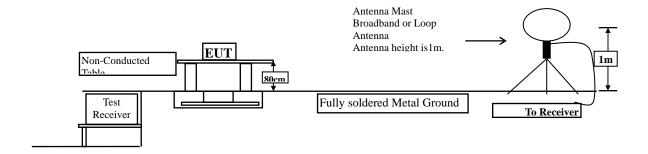


### 5. Radiated Emission

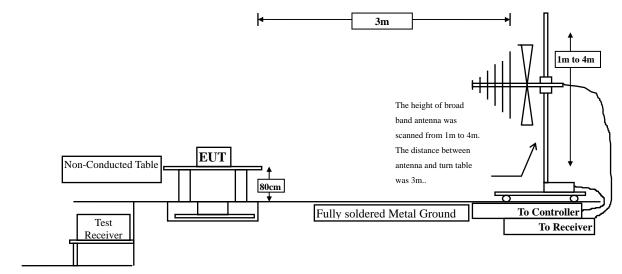
# 5.1. Test Setup

Radiated Emission Under 30MHz

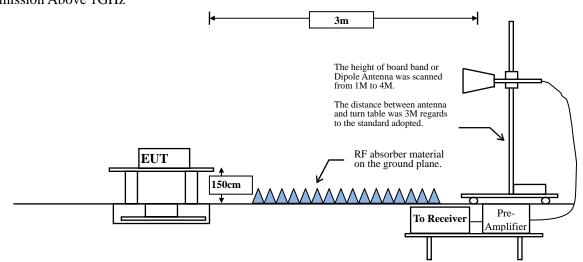




### Radiated Emission Below 1GHz



### Radiated Emission Above 1GHz



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### 5.2. 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				
IVIII	(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)



#### **5.3.** 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 measurement frequency range form 9kHz - 10th Harmonic of fundamental was investigated.



### **RBW** and **VBW** Parameter setting:

According to KDB 789033 section II.G.5 Procedure for Unwanted Maximum Emissions Measurements above 1000 MHz.

RBW = 1MHz.

 $VBW \ge 3MHz$ .

According to KDB 789033 section II.G.6 Procedures for Average Unwanted Emissions Measurements above 1000 MHz.

RBW = 1MHz.

VBW = 10Hz, when duty cycle  $\geq$  98 %

VBW  $\geq$  1/T, when duty cycle < 98 %

( T refers to the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.)

2.4GHz band	Duty Cycle	Т	1/T	VBW
	(%)	(ms)	(Hz)	(Hz)
802.11a	100.00			10
802.11n20	100.00			10

Note: Duty Cycle Refer to Section 8

### 5.4. Uncertainty

Horizontal polarization:

30-300MHz: ±4.08dB; 300M-1GHz: ±3.86dB; 1-18GHz: ±3.77dB; 18-40GHz: ±3.98dB

Vertical polarization:

30-300MHz: ±4.81dB; 300M-1GHz: ±3.87dB; 1-18GHz: ±3.83dB; 18-40GHz: ±3.98dB



### 5.5. Test Result of Radiated Emission

Product : Tablet PC

Test Item : Harmonic Radiated Emission Data

Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5180MHz)

Test Date : 2018/01/16

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dΒμV	$dB\mu V/m$	dB	$dB\mu V/m$
Horizontal					
Peak Detector:					
10360.000	3.504	43.280	46.785	-27.215	74.000
Average Detector:					
					54.000
Vertical					
Peak Detector:					
10360.000	3.504	43.670	47.175	-26.825	74.000
Average					
<b>Detector:</b>					
					54.000

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



Test Item : Harmonic Radiated Emission Data

Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5220MHz)

Test Date : 2018/01/16

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBμV	$dB\mu V/m$	dB	$dB\mu V/m$
Horizontal					
Peak Detector:					
10440.000	3.544	42.870	46.414	-27.586	74.000
Average					
<b>Detector:</b>					
					54.000
Vertical					
Peak Detector:					
10440.000	3.544	43.010	46.554	-27.446	74.000
Average					
<b>Detector:</b>					
					54.000

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



Test Item : Harmonic Radiated Emission Data

Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5240MHz)

Test Date : 2018/01/16

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBμV	$dB\mu V/m$	dB	$dB\mu V/m$
Horizontal					
Peak Detector:					
10480.000	3.639	43.370	47.010	-26.990	74.000
Average					
<b>Detector:</b>					
					54.000
Vertical					
Peak Detector:					
10480.000	3.639	43.820	47.460	-26.540	74.000
Average					
<b>Detector:</b>					
					54.000

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



Test Item : Harmonic Radiated Emission Data

Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5745MHz)

Test Date : 2018/01/16

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	$dB\mu V$	$dB\mu V/m$	dB	$dB\mu V/m$
Horizontal					
Peak Detector:					
11490.000	5.544	43.130	48.674	-25.326	74.000
Average Detector:					
					54.000
Vertical					
<b>Peak Detector:</b>					
11490.000	5.544	43.480	49.024	-24.976	74.000
Average					
<b>Detector:</b>					
					54.000

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



Test Item : Harmonic Radiated Emission Data

Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5785MHz)

Test Date : 2018/01/16

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dΒμV	$dB\mu V/m$	dB	$dB\mu V/m$
Horizontal					
<b>Peak Detector:</b>					
11570.000	5.749	43.780	49.530	-24.470	74.000
Average					
<b>Detector:</b>					
					54.000
Vertical					
Peak Detector:					
11570.000	5.749	44.940	50.690	-23.310	74.000
Average					
<b>Detector:</b>					
					54.000

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



Test Item : Harmonic Radiated Emission Data

Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5825MHz)

Test Date : 2018/01/16

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dΒμV	$dB\mu V/m$	dB	$dB\mu V/m$
Horizontal					
Peak Detector:					
11650.000	5.938	42.510	48.448	-25.552	74.000
Average					
<b>Detector:</b>					
					54.000
Vertical					
Peak Detector:					
11650.000	5.938	44.630	50.568	-23.432	74.000
Average					
<b>Detector:</b>					
					54.000

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



Test Item : Harmonic Radiated Emission Data

Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5180MHz)

Test Date : 2018/01/16

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dΒμV	$dB\mu V/m$	dB	$dB\mu V/m$
Horizontal					
<b>Peak Detector:</b>					
10360.000	3.504	43.070	46.575	-27.425	74.000
Average					
<b>Detector:</b>					
					54.000
Vertical					
Peak Detector:					
10360.000	3.504	43.820	47.325	-26.675	74.000
Average					
<b>Detector:</b>					
					54.000

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



Test Item : Harmonic Radiated Emission Data

Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5220MHz)

Test Date : 2018/01/16

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dΒμV	$dB\mu V/m$	dB	$dB\mu V/m$
Horizontal					
Peak Detector:					
10440.000	3.544	42.910	46.454	-27.546	74.000
Average Detector:					
					54.000
Vertical					
<b>Peak Detector:</b>					
10440.000	3.544	42.680	46.224	-27.776	74.000
Average					
<b>Detector:</b>					
					54.000

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



Test Item : Harmonic Radiated Emission Data

Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5240MHz)

Test Date : 2018/01/16

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dΒμV	$dB\mu V/m$	dB	$dB\mu V/m$
Horizontal					
<b>Peak Detector:</b>					
10480.000	3.639	42.770	46.410	-27.590	74.000
<b>A</b>					
Average Detector:					
					54.000
Vertical					
Peak Detector:					
10480.000	3.639	43.630	47.270	-26.730	74.000
Average					
<b>Detector:</b>					
					54.000

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



Test Item : Harmonic Radiated Emission Data

Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5745MHz)

Test Date : 2018/01/16

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dΒμV	$dB\mu V/m$	dB	$dB\mu V/m$
Horizontal					
<b>Peak Detector:</b>					
11490.000	5.544	43.910	49.454	-24.546	74.000
Average					
<b>Detector:</b>					54.000
 Vertical					34.000
Peak Detector:					
11490.000	5.544	44.890	50.434	-23.566	74.000
Average					
Detector:					
					54.000

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



Test Item : Harmonic Radiated Emission Data

Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5785MHz)

Test Date : 2018/01/16

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	$dB\mu V$	$dB\mu V/m$	dB	$dB\mu V/m$
Horizontal					
Peak Detector:					
11570.000	5.749	44.960	50.710	-23.290	74.000
Average					
<b>Detector:</b>					
					54.000
Vertical					
<b>Peak Detector:</b>					
11570.000	5.749	47.020	52.770	-21.230	74.000
Average					
<b>Detector:</b>					
					54.000

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



Test Item : Harmonic Radiated Emission Data

Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5825MHz)

Test Date : 2018/01/16

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>					
11650.000	5.938	42.340	48.278	-25.722	74.000
Average					
<b>Detector:</b>					
 \$7 4. 1					54.000
Vertical Peak Detector:					
11650.000	5.938	44.180	50.118	-23.882	74.000
Average					
<b>Detector:</b>					
					54.000

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



Test Item : General Radiated Emission

Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5220MHz)

Test Date : 2018/01/18

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	$dB\mu V$	$dB\mu V/m$	dB	$dB\mu V/m$
Horizontal					
132.623	-11.694	37.264	25.570	-17.930	43.500
195.884	-13.430	37.699	24.269	-19.231	43.500
353.333	-8.662	37.488	28.826	-17.174	46.000
627.464	-2.825	31.373	28.547	-17.453	46.000
841.145	0.202	30.250	30.452	-15.548	46.000
992.971	2.106	29.479	31.584	-22.416	54.000
Vertical					
46.870	-10.839	43.228	32.389	-7.611	40.000
195.884	-13.430	40.269	26.839	-16.661	43.500
406.754	-7.186	34.705	27.519	-18.481	46.000
666.826	-2.298	30.808	28.511	-17.489	46.000
814.435	-0.153	29.798	29.645	-16.355	46.000
939.551	1.327	29.932	31.258	-14.742	46.000

- 1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Measurement Level = Reading Level + Correct Factor.
- 3. Correct Factor = Antenna factor + Cable loss Amplifier gain.
- 4. The emission levels of other frequencies are very lower than the limit and not show in test report.
- 5. No emission found between lowest internal used/generated frequency to 30MHz.



Test Item : General Radiated Emission

Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5785MHz)

Test Date : 2018/01/18

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	$dB\mu V$	$dB\mu V/m \\$	dB	$dB\mu V/m$
Horizontal					_
134.029	-11.559	37.429	25.870	-17.630	43.500
194.478	-13.411	37.951	24.540	-18.960	43.500
408.159	-7.153	36.632	29.479	-16.521	46.000
727.275	-1.224	30.417	29.192	-16.808	46.000
843.957	0.235	30.469	30.704	-15.296	46.000
995.783	2.154	29.727	31.881	-22.119	54.000
Vertical					
48.275	-10.834	42.813	31.979	-8.021	40.000
195.884	-13.430	41.310	27.880	-15.620	43.500
403.942	-7.251	34.963	27.712	-18.288	46.000
593.725	-3.219	31.483	28.265	-17.735	46.000
741.333	-1.010	30.880	29.870	-16.130	46.000
932.522	1.249	30.176	31.426	-14.574	46.000

- 1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Measurement Level = Reading Level + Correct Factor.
- 3. Correct Factor = Antenna factor + Cable loss Amplifier gain.
- 4. The emission levels of other frequencies are very lower than the limit and not show in test report.
- 5. No emission found between lowest internal used/generated frequency to 30MHz.



Test Item : General Radiated Emission

Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5220MHz)

Test Date : 2018/01/18

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
 MHz	dB	$dB\mu V$	$dB\mu V/m$	dB	$dB\mu V/m$
Horizontal					
48.275	-10.834	34.216	23.382	-16.618	40.000
134.029	-11.559	37.197	25.638	-17.862	43.500
356.145	-8.584	39.153	30.569	-15.431	46.000
583.884	-3.455	30.996	27.541	-18.459	46.000
801.783	-0.303	30.393	30.090	-15.910	46.000
886.130	0.764	31.706	32.470	-13.530	46.000
Vertical					
46.870	-10.839	43.768	32.929	-7.071	40.000
197.290	-13.451	40.019	26.568	-16.932	43.500
405.348	-7.219	35.013	27.794	-18.206	46.000
655.580	-2.517	30.360	27.843	-18.157	46.000
782.101	-0.533	31.221	30.688	-15.312	46.000

### Note:

987.348

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

31.597

-22.403

54.000

2. Measurement Level = Reading Level + Correct Factor.

2.022

- 3. Correct Factor = Antenna factor + Cable loss Amplifier gain.
- 4. The emission levels of other frequencies are very lower than the limit and not show in test report.
- 5. No emission found between lowest internal used/generated frequency to 30MHz.

29.575



Test Item : General Radiated Emission

Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5785MHz)

Test Date : 2018/01/18

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	$dB\mu V$	$dB\mu V/m$	dB	$dB\mu V/m$
Horizontal					
124.188	-12.577	38.562	25.985	-17.515	43.500
354.739	-8.623	37.348	28.725	-17.275	46.000
409.565	-7.121	35.060	27.939	-18.061	46.000
620.435	-2.883	31.082	28.199	-17.801	46.000
789.130	-0.452	30.014	29.562	-16.438	46.000
925.493	1.183	30.203	31.386	-14.614	46.000
Vertical					
46.870	-10.839	43.219	32.380	-7.620	40.000
239.464	-11.898	37.899	26.000	-20.000	46.000
485.478	-5.552	34.046	28.495	-17.505	46.000
696.348	-1.731	30.979	29.249	-16.751	46.000
869.261	0.561	30.684	31.246	-14.754	46.000

#### Note:

1000.000

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

33.196

-20.804

54.000

2. Measurement Level = Reading Level + Correct Factor.

2.220

- 3. Correct Factor = Antenna factor + Cable loss Amplifier gain.
- 4. The emission levels of other frequencies are very lower than the limit and not show in test report.
- 5. No emission found between lowest internal used/generated frequency to 30MHz.

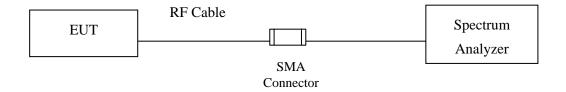
30.976

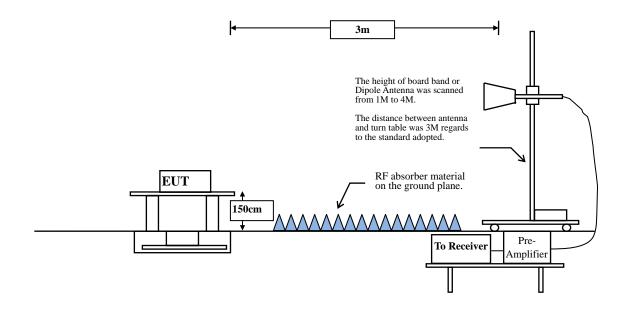


# 6. Band Edge

# 6.1. Test Setup

# **RF Conducted Measurement:**







#### 6.2. 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  $(dB\mu V) = 20 \log RF \text{ Voltage } (uV)$ 
  - 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.

#### **6.3. 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.



### **RBW** and **VBW** Parameter setting:

According to KDB 789033 section II.G.5 Procedure for Unwanted Maximum Emissions Measurements above 1000 MHz.

RBW = 1MHz.

 $VBW \ge 3MHz$ .

According to KDB 789033 section II.G.6 Procedures for Average Unwanted Emissions Measurements above 1000 MHz.

RBW = 1MHz.

VBW = 10Hz, when duty cycle  $\geq$  98 %

VBW  $\geq$  1/T, when duty cycle < 98 %

( T refers to the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.)

2.4GHz band	Duty Cycle	Т	1/T	VBW
	(%)	(ms)	(Hz)	(Hz)
802.11a	100.00			10
802.11n20	100.00			10

Note: Duty Cycle Refer to Section 8

# 6.4. Uncertainty

Conducted: ±1.23dB

Radiated:

Horizontal polarization : 1-18GHz: ±3.77dB Vertical polarization : 1-18GHz : ±3.83dB



# 6.5. Test Result of Band Edge

Product : Tablet PC

Test Item : Band Edge Data

Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5180MHz)

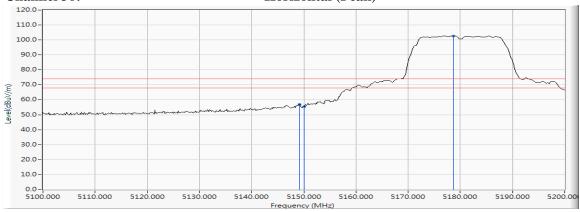
Test Date : 2018/01/16

# RF Radiated Measurement (Horizontal):

Channel No.	Frequency	Correct Factor	Reading Level	<b>Emission Level</b>	Peak Limit	Average Limit	Result
	(MHz)	(dB)	(dBµV)	$(dB\mu V/m)$	$(dB\mu V/m)$	$(dB\mu V/m)$	Result
36 (Peak)	5149.130	18.331	38.459	56.790	74.00	54.00	Pass
36 (Peak)	5150.000	18.335	36.843	55.177	74.00	54.00	Pass
36 (Peak)	5178.696	18.398	84.287	102.685			
36 (Average)	5150.000	18.335	23.616	51.891	74.00	54.00	Pass
36 (Average)	5178.841	18.398	75.035	100.788			

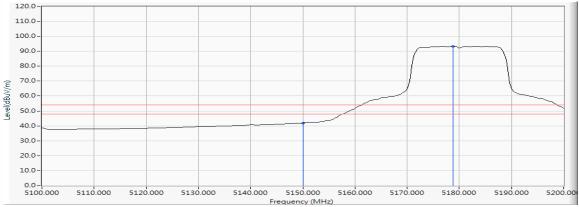
### **Figure Channel 36:**

### Horizontal (Peak)



# Figure Channel 36:

# Horizontal (Average)



- 1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Measurement Level = Reading Level + Correct Factor.
- 3. The average measurement was not performed when the peak measured data under the limit of average detection.



Test Item : Band Edge Data

Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5180MHz)

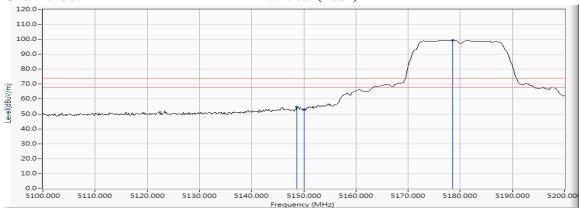
Test Date : 2018/01/16

### RF Radiated Measurement (Vertical):

Channel No.	Frequency	Correct Factor	Reading Level	Emission Level	Peak Limit	Average Limit	Dagult
	(MHz)	(dB)	$(dB\mu V)$	$(dB\mu V/m)$	$(dB\mu V/m)$	$(dB\mu V/m)$	Result
36 (Peak)	5148.696	18.330	36.520	54.850	74.00	54.00	Pass
36 (Peak)	5150.000	18.335	34.309	52.643	74.00	54.00	Pass
36 (Peak)	5178.551	18.398	81.125	99.523			
36 (Average)	5150.000	18.335	21.679	40.013	74.00	54.00	Pass
36 (Average)	5178.841	18.398	71.882	90.281	-		

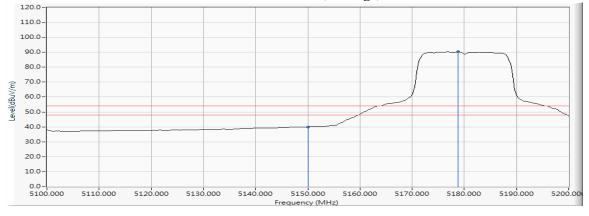
## **Figure Channel 36:**

# Vertical (Peak)



#### **Figure Channel 36:**

#### Vertical (Average)



- 1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Measurement Level = Reading Level + Correct Factor.
- 3. The average measurement was not performed when the peak measured data under the limit of average detection.

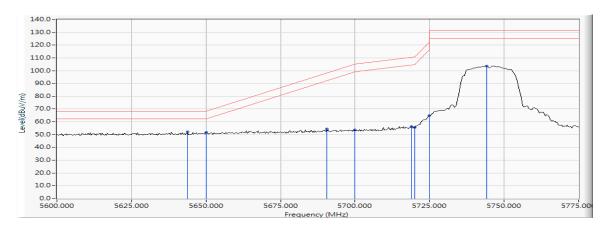


Test Item : Band Edge Data

Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5745MHz)

Test Date : 2018/01/16

	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Emission Level (dBµV/m)	Margin (dB)	Limit (dBµV/m)	Result
Horizontal	5643.877	19.522	32.764	52.285	-15.935	68.220	Pass
Horizontal	5650.000	19.535	32.185	51.721	-16.499	68.220	Pass
Horizontal	5690.543	19.637	34.658	54.296	-43.910	98.206	Pass
Horizontal	5700.000	19.659	34.042	53.701	-51.499	105.200	Pass
Horizontal	5718.949	19.709	36.735	56.443	-54.063	110.506	Pass
Horizontal	5720.000	19.711	35.689	55.400	-55.400	110.800	Pass
Horizontal	5725.000	19.725	45.037	64.762	-57.438	122.200	Pass
Horizontal	5744.058	19.760	84.013	103.773			



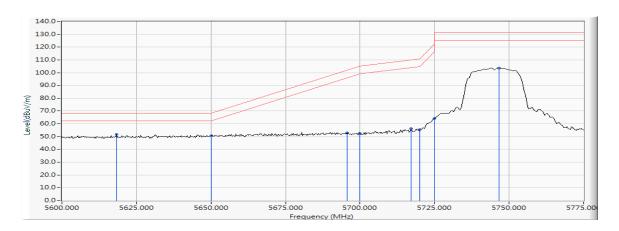


Test Item : Band Edge Data

Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5745MHz)

Test Date : 2018/01/16

	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Emission Level (dBµV/m)	Margin (dB)	Limit (dBµV/m)	Result
Vertical	5618.261	19.463	32.208	51.671	-16.549	68.220	Pass
Vertical	5650.000	19.535	31.299	50.835	-17.385	68.220	Pass
Vertical	5695.616	19.648	33.219	52.868	-49.090	101.958	Pass
Vertical	5700.000	19.659	32.798	52.457	-52.743	105.200	Pass
Vertical	5717.174	19.704	36.422	56.125	-53.884	110.009	Pass
Vertical	5720.000	19.711	35.758	55.469	-55.331	110.800	Pass
Vertical	5725.000	19.725	44.270	63.995	-58.205	122.200	Pass
Vertical	5746.594	19.765	83.957	103.723			



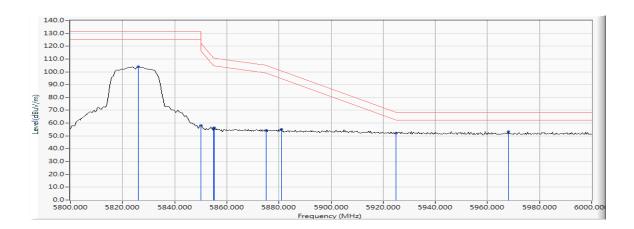


Test Item : Band Edge Data

Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5825MHz)

Test Date : 2018/01/16

	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Emission Level (dBµV/m)	Margin (dB)	Limit (dBµV/m)	Result
Horizontal	5826.087	19.943	83.928	103.870			
Horizontal	5850.000	19.992	38.265	58.257	-63.943	122.200	Pass
Horizontal	5855.000	20.003	35.848	55.850	-54.950	110.800	Pass
Horizontal	5855.072	20.003	36.335	56.337	-54.443	110.780	Pass
Horizontal	5875.000	20.048	34.515	54.562	-50.638	105.200	Pass
Horizontal	5880.870	20.061	35.155	55.216	-45.643	100.859	Pass
Horizontal	5925.000	20.181	31.959	52.141	-16.079	68.220	Pass
Horizontal	5968.116	20.285	33.117	53.402	-14.818	68.220	Pass



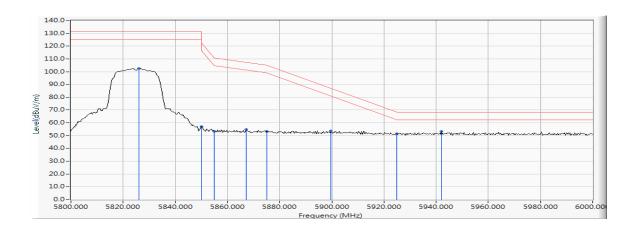


Test Item : Band Edge Data

Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5825MHz)

Test Date : 2018/01/16

	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Emission Level (dBµV/m)	Margin (dB)	Limit (dBµV/m)	Result
Vertical	5826.087	19.943	82.588	102.530			
Vertical	5850.000	19.992	37.010	57.002	-65.198	122.200	Pass
Vertical	5855.000	20.003	33.307	53.309	-57.491	110.800	Pass
Vertical	5867.246	20.029	34.739	54.769	-52.602	107.371	Pass
Vertical	5875.000	20.048	33.416	53.463	-51.737	105.200	Pass
Vertical	5899.710	20.104	33.591	53.695	-33.229	86.924	Pass
Vertical	5925.000	20.181	31.098	51.280	-16.940	68.220	Pass
Vertical	5942.029	20.220	32.990	53.210	-15.010	68.220	Pass





Test Item : Band Edge Data

Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5180MHz)

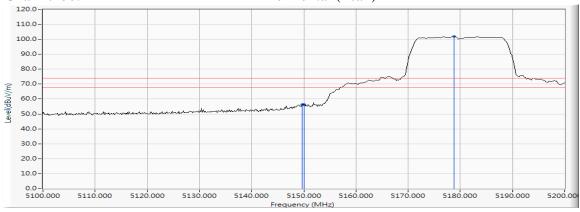
Test Date : 2018/01/16

#### **RF Radiated Measurement (Horizontal):**

Channel No.	Frequency	Correct Factor	Reading Level	Emission Level	Peak Limit	Average Limit	Result
	(MHz)	(dB)	$(dB\mu V)$	$(dB\mu V/m)$	$(dB\mu V/m)$	$(dB\mu V/m)$	Result
36 (Peak)	5149.710	18.333	37.925	56.258	74.00	54.00	Pass
36 (Peak)	5150.000	18.335	37.862	56.196	74.00	54.00	Pass
36 (Peak)	5178.841	18.398	83.490	101.889			
36 (Average)	5150.000	18.335	22.873	41.207	74.00	54.00	Pass
36 (Average)	5177.246	18.394	73.941	92.335			

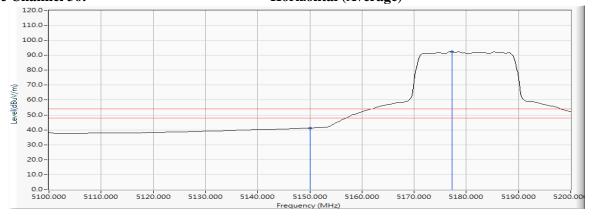
### **Figure Channel 36:**

# Horizontal (Peak)



#### **Figure Channel 36:**

#### **Horizontal (Average)**



- 1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Measurement Level = Reading Level + Correct Factor.
- 3. The average measurement was not performed when the peak measured data under the limit of average detection.



Test Item : Band Edge Data

Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5180MHz)

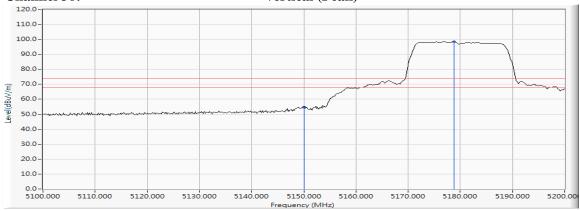
Test Date : 2018/01/16

#### **RF** Radiated Measurement (Vertical):

Channel No.	Frequency	Correct Factor	Reading Level	Emission Level	Peak Limit	Average Limit	Result
	(MHz)	(dB)	$(dB\mu V)$	$(dB\mu V/m)$	$(dB\mu V/m)$	$(dB\mu V/m)$	Result
36 (Peak)	5150.000	18.335	36.494	54.828	74.00	54.00	Pass
36 (Peak)	5178.841	18.398	80.193	98.592			
36 (Average)	5150.000	18.335	21.025	39.359	74.00	54.00	Pass
36 (Average)	5177.101	18.394	70.788	89.182			

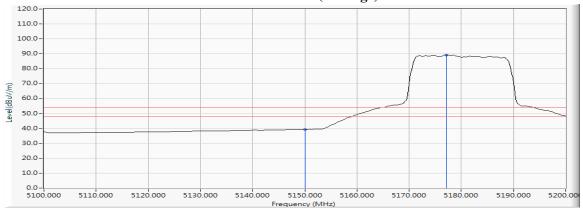
#### Figure Channel 36:

### Vertical (Peak)



### Figure Channel 36:

#### Vertical (Average)



- 1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Measurement Level = Reading Level + Correct Factor.
- 3. The average measurement was not performed when the peak measured data under the limit of average detection.

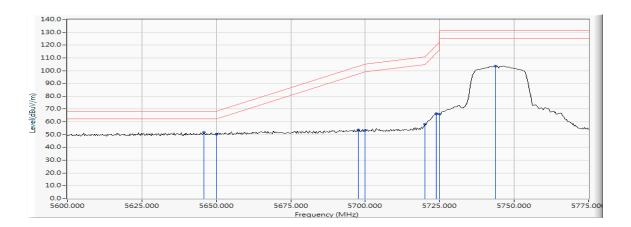


Test Item : Band Edge Data

Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5745MHz)

Test Date : 2018/01/16

	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Emission Level (dBµV/m)	Margin (dB)	Limit (dBµV/m)	Result
Horizontal	5645.906	19.526	32.398	51.924	-16.296	68.220	Pass
Horizontal	5650.000	19.535	30.849	50.385	-17.835	68.220	Pass
Horizontal	5697.645	19.653	33.911	53.564	-49.894	103.458	Pass
Horizontal	5700.000	19.659	33.777	53.436	-51.764	105.200	Pass
Horizontal	5720.000	19.711	38.391	58.102	-52.698	110.800	Pass
Horizontal	5723.768	19.721	46.737	66.459	-52.932	119.391	Pass
Horizontal	5725.000	19.725	46.276	66.001	-56.199	122.200	Pass
Horizontal	5743.804	19.760	83.973	103.733			



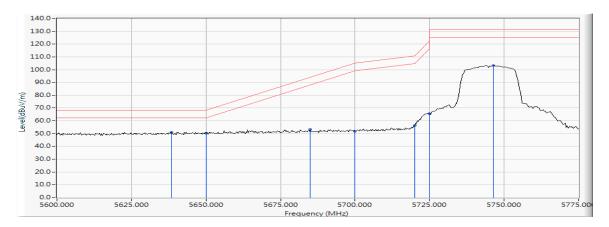


Test Item : Band Edge Data

Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5745MHz)

Test Date : 2018/01/16

	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Emission Level (dBµV/m)	Margin (dB)	Limit (dBµV/m)	Result
Vertical	5638.551	19.509	31.681	51.190	-17.030	68.220	Pass
Vertical	5650.000	19.535	30.721	50.257	-17.963	68.220	Pass
Vertical	5684.964	19.619	33.837	53.456	-40.623	94.079	Pass
Vertical	5700.000	19.659	32.290	51.949	-53.251	105.200	Pass
Vertical	5720.000	19.711	36.736	56.447	-54.353	110.800	Pass
Vertical	5725.000	19.725	46.057	65.782	-56.418	122.200	Pass
Vertical	5746.341	19.765	83.540	103.305			



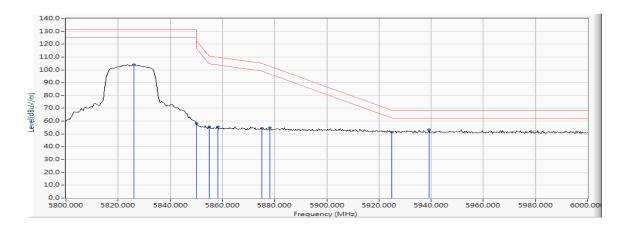


Test Item : Band Edge Data

Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5825MHz)

Test Date : 2018/01/16

	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Emission Level (dBµV/m)	Margin (dB)	Limit (dBµV/m)	Result
Horizontal	5826.087	19.943	84.119	104.061			
Horizontal	5850.000	19.992	38.186	58.178	-64.022	122.200	Pass
Horizontal	5855.000	20.003	35.412	55.414	-55.386	110.800	Pass
Horizontal	5858.261	20.009	35.609	55.618	-54.269	109.887	Pass
Horizontal	5875.000	20.048	34.249	54.296	-50.904	105.200	Pass
Horizontal	5878.261	20.055	34.784	54.839	-47.949	102.788	Pass
Horizontal	5925.000	20.181	31.181	51.363	-16.857	68.220	Pass
Horizontal	5939.130	20.213	33.051	53.264	-14.956	68.220	Pass



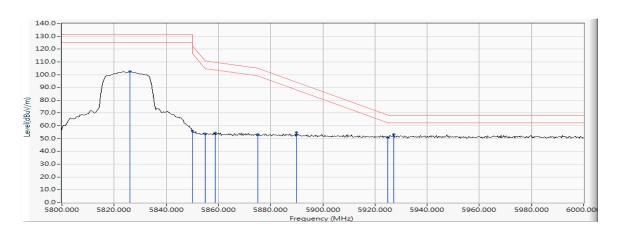


Test Item : Band Edge Data

Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5825MHz)

Test Date : 2018/01/16

	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Emission Level (dBµV/m)	Margin (dB)	Limit (dBµV/m)	Result
Vertical	5826.087	19.943	82.579	102.521			
Vertical	5850.000	19.992	36.067	56.059	-66.141	122.200	Pass
Vertical	5855.000	20.003	33.498	53.500	-57.300	110.800	Pass
Vertical	5858.841	20.010	34.502	54.512	-55.213	109.725	Pass
Vertical	5875.000	20.048	33.084	53.131	-52.069	105.200	Pass
Vertical	5889.855	20.082	34.749	54.830	-39.383	94.213	Pass
Vertical	5925.000	20.181	30.858	51.040	-17.180	68.220	Pass
Vertical	5927.246	20.188	32.964	53.151	-15.069	68.220	Pass

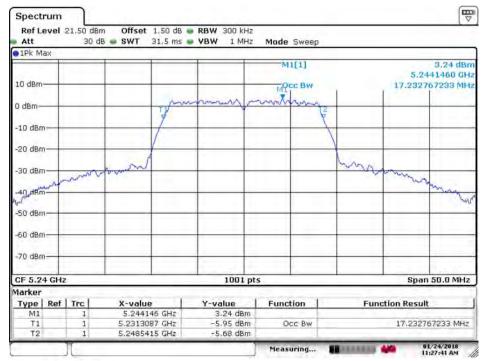




Test Item : Band Edge Data

Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5240MHz)

Test Frequency	Measurement Level	Limit	Result
(MHz)	(MHz)	(MHz)	
5240	5248.54	<5250	PASS



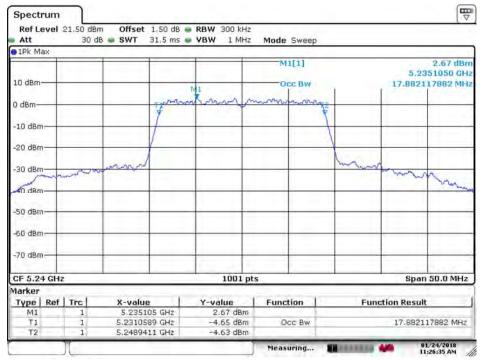
Date: 24.JAN.2018 11:27:41



Test Item : Band Edge Data

Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5240MHz)

Test Frequency	Measurement Level	Limit	Result
(MHz)	(MHz)	(MHz)	
5240	5248.94	<5250	PASS

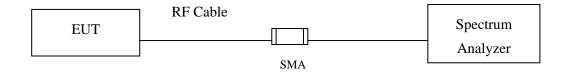


Date: 24.JAN 2018 11:26:35



# 7. Occupied Bandwidth

# 7.1. Test Setup



# 7.2. Limits

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

# 7.3. .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.

# 7.4. Uncertainty

±671.83Hz



# 7.5. Test Result of Occupied Bandwidth

Product : Tablet PC

Test Item : Occupied Bandwidth Data

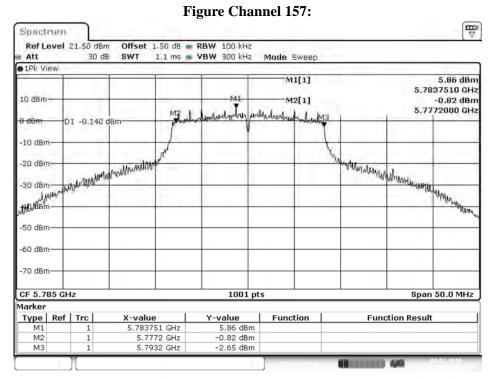
Test Mode : Mode 1: Transmit (802.11a-6Mbps)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
149	5745	15550	>500	Pass
157	5785	16000	>500	Pass
165	5825	15200	>500	Pass

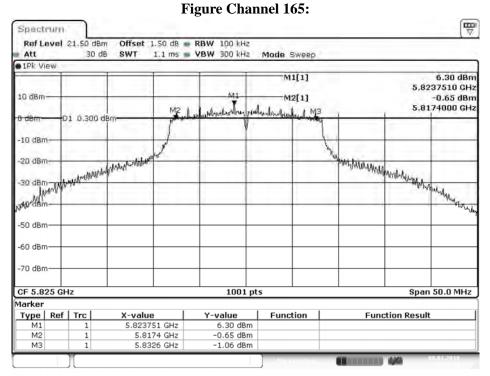
#### Figure Channel 149: The state of the s Spectrum Ref Level 21,50 dBm Offset 1.50 d8 - RBW 100 kHz Att 1.1 ms - VBW 300 kHz Mode Sweep • IPR View M1[1] 6.13 dBm 5,7462490 GHz 10 dBm -1.21 dBm 5.7374000 GHz D1 0.130 dBn What he was the was th whaten the many mander appropriate -50 dBm -60 dBm -70 dBm 1001 pts Span 50.0 MHz CF 5.745 GHz Marker Y-value 6.13 dBm -1.21 dBm **Function Result** Type | Ref | Trc | 5.746249 GHz 5.7374 GHz МЗ 5.75295 GHz -0.26 dBm

Date: 8.JAN.2018 15:35:17





Date: 8.JAN.2018 15:37:26



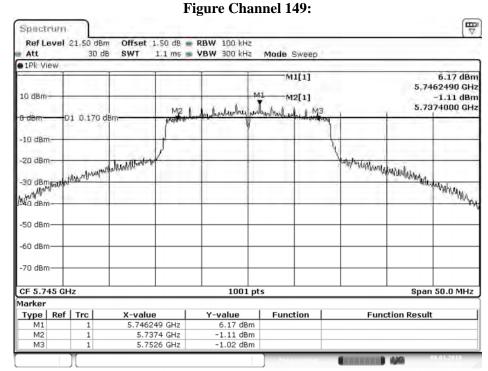
Date: 8.JAN.2018 15:39:31



Test Item : Occupied Bandwidth Data

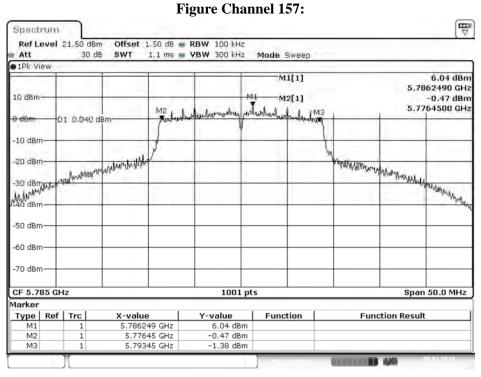
Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
149	5745	15200	>500	Pass
157	5785	17000	>500	Pass
165	5825	17150	>500	Pass

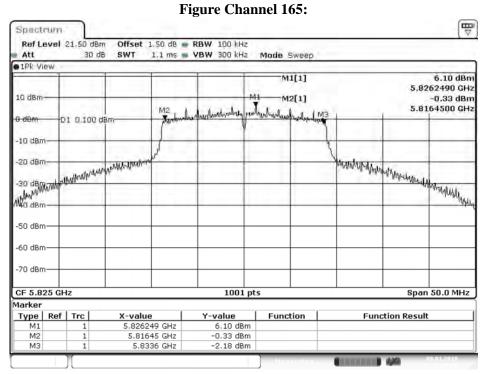


Date: 8.JAN.2018 15:42:15





Date: 8.JAN.2018 15:44:41

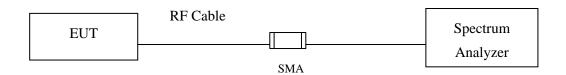


Date: 8.JAN.2018 15:47:28



# 8. Duty Cycle

# 8.1. Test Setup



# 8.2. Test Procedure

The EUT was setup according to ANSI C63.10 2013; tested according to U-NII test procedure of KDB789033 for compliance to FCC 47CFR 15.407 requirements.

# 8.3. Uncertainty

± 2.31msec



# 8.4. Test Result of Duty Cycle

Product : Tablet PC
Test Item : Duty Cycle
Test Mode : Transmit

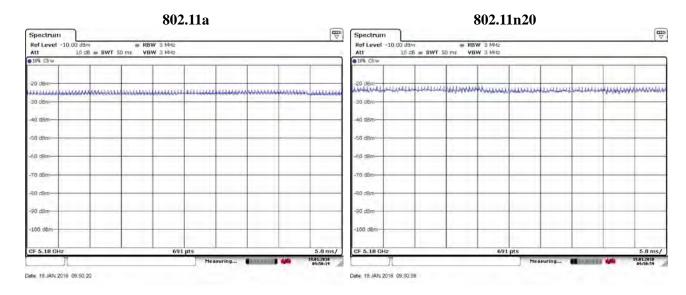
Duty Cycle Formula:

Duty Cycle = Ton / (Ton + Toff)

Duty Factor = 10 Log (1/Duty Cycle)

Results:

Mode	Ton	Ton + Toff	Duty Cycle	Duty Factor
Mode	(ms) (ms)		(%)	(dB)
802.11 a			100.00	0.00
802.11 n20			100.00	0.00





9.	<b>EMI</b>	Reduction	Method	<b>During</b>	Compliance	Testing
<i>-</i>		110uucuon	111001100	_ ~ ~ ~ ~ ~	Compilation	

No modification was made during testing.