



7.5. Conducted Band Edge and Out-of-Band Emissions

7.5.1. Test Limit

The limit for out-of-band spurious emissions at the band edge is 30dB below the fundamental emission level, as determined from the in-band power measurement of the DTS channel performed in a 100 kHz bandwidth per the PSD procedure.

7.5.2. Test Procedure Used

KDB 558074 D01v03r03 - Section 11.2 & Section 11.3

7.5.3. Test Settitng

1. Reference level measurement

- (a) Set instrument center frequency to DTS channel center frequency
- (b) Set the span to ≥ 1.5 times the DTS bandwidth
- (c) Set the RBW = 100 kHz
- (d) Set the VBW \geq 3 x RBW
- (e) Detector = peak
- (f) Sweep time = auto couple
- (g) Trace mode = max hold
- (h) Allow trace to fully stabilize

2. Emission level measurement

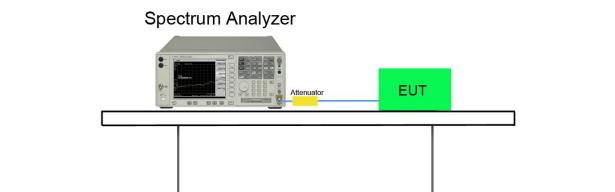
- (a) Set the center frequency and span to encompass frequency range to be measured
- (b) RBW = 100kHz
- (c) VBW = 300kHz
- (d) Detector = Peak
- (e) Trace mode = max hold
- (f) Sweep time = auto couple
- (g) The trace was allowed to stabilize

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7.5.4. Test Setup



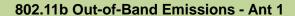


7.5.5. Test Result

Test Mode	Data Rate (Mbps)	Channel No. Frequency (MHz)		Limit	Result
Ant 1					
802.11b	1	01	2412	30dBc	Pass
802.11b	1	06	2437	30dBc	Pass
802.11b	1	11	2462	30dBc	Pass
802.11g	6	01	2412	30dBc	Pass
802.11g	6	06	2437	30dBc	Pass
802.11g	6	11	2462	30dBc	Pass
802.11n-HT20	6.5	01	2412	30dBc	Pass
802.11n-HT20	6.5	06	2437	30dBc	Pass
802.11n-HT20	6.5	11	2462	30dBc	Pass
802.11n-HT40	13.5	03	2422	30dBc	Pass
802.11n-HT40	13.5	06	2437	30dBc	Pass
802.11n-HT40	13.5	09	2452	30dBc	Pass
Ant 2					
802.11b	1	01	2412	30dBc	Pass
802.11b	1	06	2437	30dBc	Pass
802.11b	1	11	2462	30dBc	Pass
802.11g	6	01	2412	30dBc	Pass
802.11g	6	06	2437	30dBc	Pass
802.11g	6	11	2462	30dBc	Pass
802.11n-HT20	6.5	01	2412	30dBc	Pass
802.11n-HT20	6.5	06	2437	30dBc	Pass
802.11n-HT20	6.5	11	2462	30dBc	Pass
802.11n-HT40	13.5	03	2422	30dBc	Pass
802.11n-HT40	13.5	06	2437	30dBc	Pass
802.11n-HT40	13.5	09	2452	30dBc	Pass





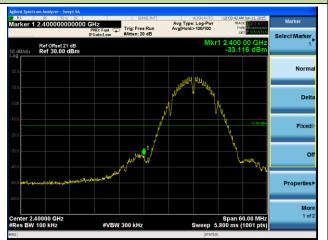


100kHz PSD Reference Level

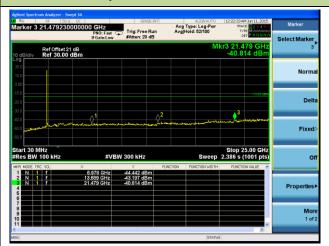


Channel 01 (2412MHz)

Low Band Edge



Spurious Emission



Channel 06 (2437MHz)

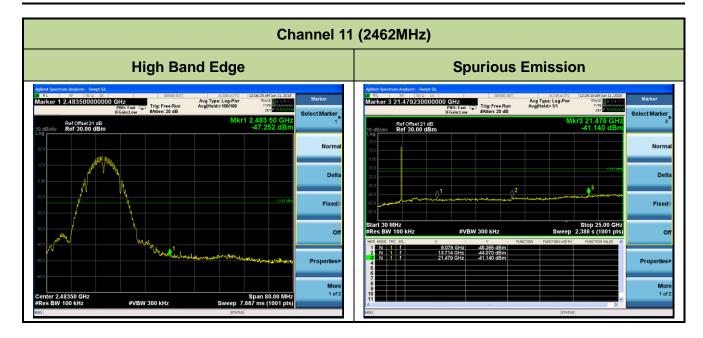
Spurious Emission



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802.11g Out-of-Band Emissions - Ant 1

100kHz PSD Reference Level



Channel 01 (2412MHz)

Low Band Edge



Spurious Emission



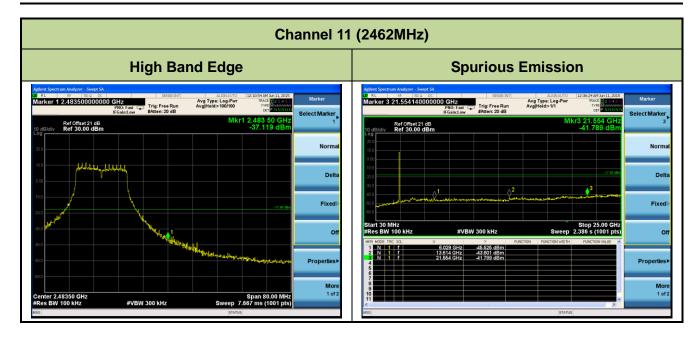
Channel 06 (2437MHz)

Spurious Emission













802.11n-HT20 Out-of-Band Emissions - Ant 1

100kHz PSD Reference Level



Channel 01 (2412MHz)

Low Band Edge

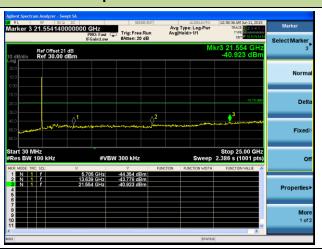


Spurious Emission



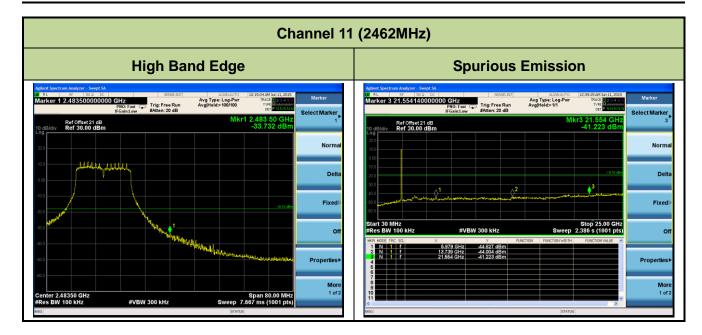
Channel 06 (2437MHz)

Spurious Emission



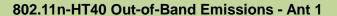




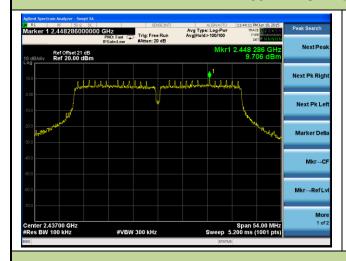






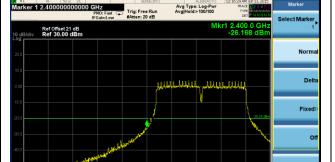


100kHz PSD Reference Level

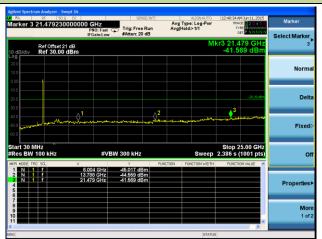


Channel 03 (2422MHz)

Low Band Edge



Spurious Emission



Channel 06 (2437MHz)

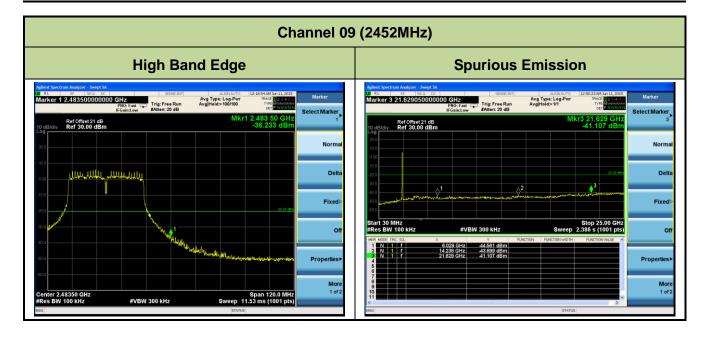
Spurious Emission



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802.11b Out-of-Band Emissions - Ant 2

100kHz PSD Reference Level

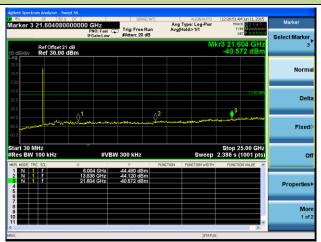


Channel 01 (2412MHz)

Low Band Edge



Spurious Emission



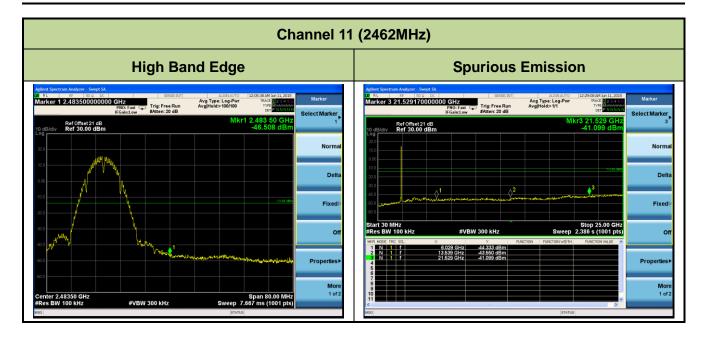
Channel 06 (2437MHz)

Spurious Emission







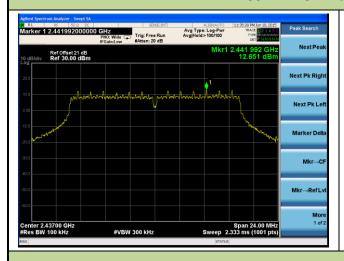






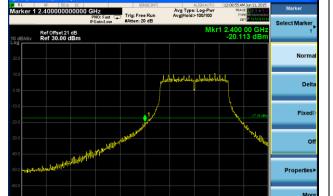
802.11g Out-of-Band Emissions - Ant 2

100kHz PSD Reference Level



Channel 01 (2412MHz)

Low Band Edge



Spurious Emission



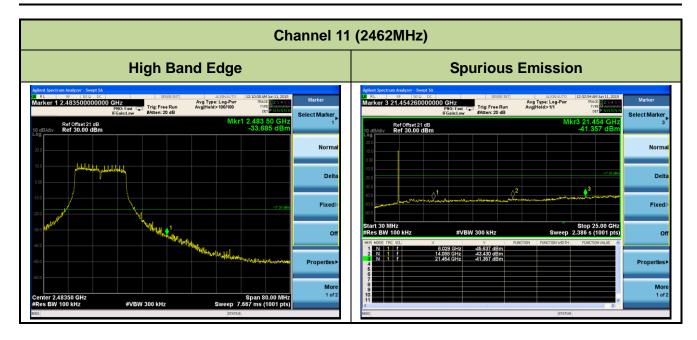
Channel 06 (2437MHz)

Spurious Emission



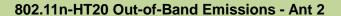




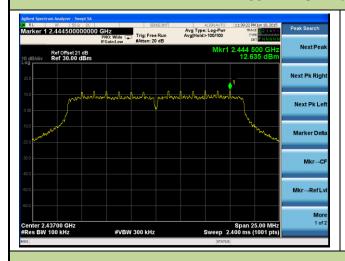






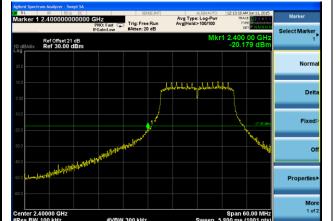


100kHz PSD Reference Level

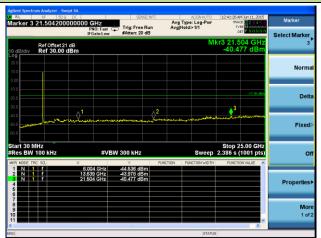


Channel 01 (2412MHz)

Low Band Edge



Spurious Emission



Channel 06 (2437MHz)

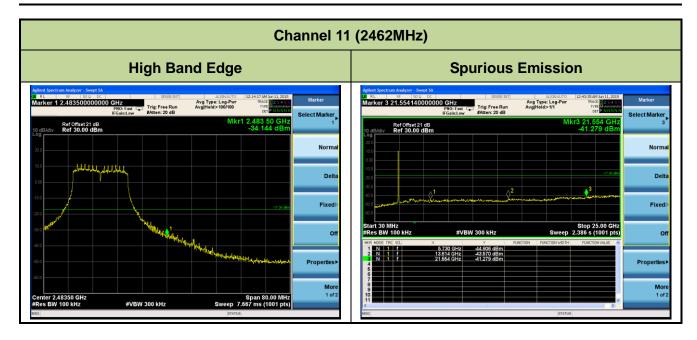
Spurious Emission



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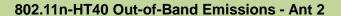












100kHz PSD Reference Level

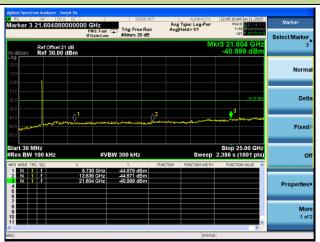


Channel 03 (2422MHz)

Low Band Edge



Spurious Emission



Channel 06 (2437MHz)

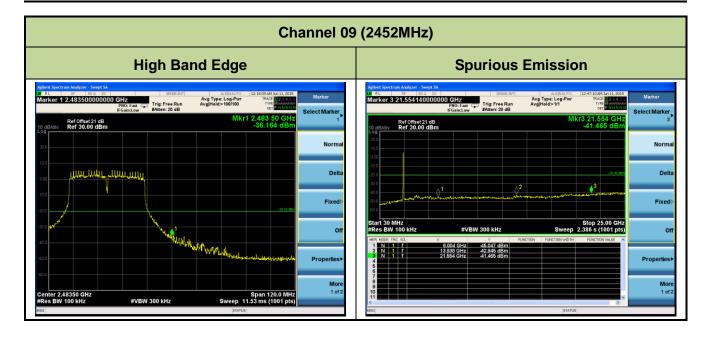
Spurious Emission



FCC ID: 2AD8UFZCWI2A1 IC: 109D-FZCWI2A01









7.6. Radiated Spurious Emission Measurement

7.6.1. Test Limit

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Table per Section 15.209.

+7 Of It must not exceed the limits shown in Tuble per dection 10.200.								
FCC Part 15 Subpart C Paragraph 15.209								
Frequency [MHz]	Field Strength [V/m]	Measured Distance [Meters]						
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						

7.6.2. Test Procedure Used

KDB 558074 D01v03r03 - Section 12.2.3 (quasi-peak measurements)

KDB 558074 D01v03r03 - Section 12.2.4 (peak power measurements)

KDB 558074 D01v03r03 - Section 12.2.5 (average power measurements)

7.6.3. Test Setting

Peak Field Strength Measurements

- 1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
- 2. RBW = as specified in Table 1
- 3.VBW = 3MHz
- 4. Detector = peak
- 5. Sweep time = auto couple

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- 6. Trace mode = max hold
- 7. Trace was allowed to stabilize

Table 1 - RBW as a function of frequency

Frequency	RBW		
9 ~ 150 kHz	200 ~ 300 Hz		
0.15 ~ 30 MHz	9 ~ 10 kHz		
30 ~ 1000 MHz	100 ~ 120 kHz		
> 1000 MHz	1 MHz		

Average Field Strength Measurements

- 1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
- 2.RBW = 1MHz
- 3. VBW ≥ 1/T
- 4. De As an alternative, the instrument may be set to linear detector mode. Ensure that video filtering is applied in linear voltage domain (rather than in a log or dB domain). Some instruments require linear display mode in order to accomplish this. Others have a setting for Average-VBW Type, which can be set to "Voltage" regardless of the display mode
- 5. Detector = Peak
- 6. Sweep time = auto
- 7. Trace mode = max hold
- 8. Allow max hold to run for at least 50 times (1/duty cycle) traces

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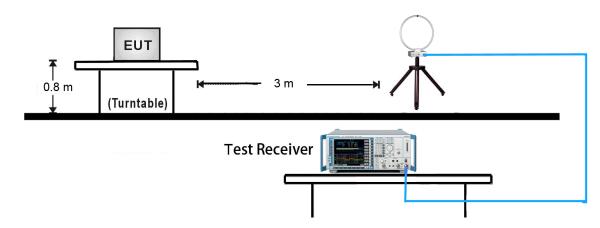
IC: 109D-FZCWI2A01



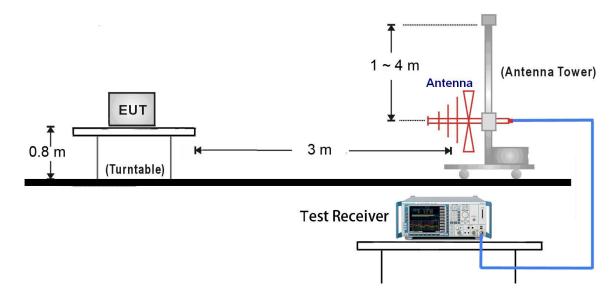


7.6.4. Test Setup

9kHz ~ 30MHz Test Setup:



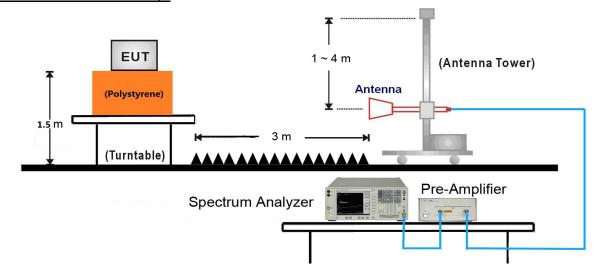
30MHz ~ 1GHz Test Setup:



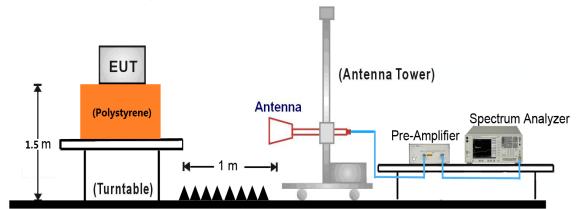




1GHz ~ 18GHz Test Setup:



18GHz ~25GHz Test Setup:







7.6.5. Test Result

Test Mode:	802.11b - Ant 1	Test Site:	AC1				
Test Channel:	01	Test Engineer:	Roy Cheng				
Remark:	Average measurement was not performed if peak level lower than average						
	limit.						
	2. Other frequency was 20dB below limit line within 1-18GHz, there is not show						
	in the report.						

Mark	Frequency	Reading	Factor	Measure	Limit	Margin	Detector	Polarization
	(MHz)	Level	(dB)	Level	(dBµV/m)	(dB)		
		(dBµV)		(dBµV/m)				
	4536.0	39.7	-3.3	36.4	74.0	-37.6	Peak	Horizontal
	5386.0	40.2	-2.5	37.7	74.0	-36.3	Peak	Horizontal
*	7086.0	39.8	1.0	40.8	84.1	-43.3	Peak	Horizontal
*	10154.5	39.4	4.1	43.5	84.1	-40.6	Peak	Horizontal
	7264.5	40.5	1.4	41.9	74.0	-32.1	Peak	Vertical
	8276.0	40.1	1.1	41.2	74.0	-32.8	Peak	Vertical
*	10044.0	40.5	4.1	44.6	84.1	-39.5	Peak	Vertical
*	12976.5	41.0	3.4	44.4	84.1	-39.7	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 30dBc of the fundamental emission level (114.1dBµV/m) or FCC 15.209 which is higher.

Note 2: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

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Test Mode:	802.11b - Ant 1	Test Site:	AC1				
Test Channel:	06	Test Engineer:	Roy Cheng				
Remark:	Average measurement was not performed if peak level lower than average						
	limit.						
	2. Other frequency was 20dB below limit line within 1-18GHz, there is not show						
	in the report.						

Mark	Frequency (MHz)	Reading Level (dBµV)	Factor (dB)	Measure Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Polarization
	7434.5	39.6	1.4	41.0	74.0	-33.0	Peak	Horizontal
	9134.5	40.3	2.4	42.7	74.0	-31.3	Peak	Horizontal
*	9908.0	39.3	4.1	43.4	84.4	-41.0	Peak	Horizontal
*	12781.0	40.8	3.1	43.9	84.4	-40.5	Peak	Horizontal
	7511.0	39.2	1.6	40.8	74.0	-33.2	Peak	Vertical
	9126.0	40.1	2.3	42.4	74.0	-31.6	Peak	Vertical
*	10520.0	40.8	4.8	45.6	84.4	-38.8	Peak	Vertical
*	13129.5	40.5	3.7	44.2	84.4	-40.2	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 30dBc of the fundamental emission level (114.4dBµV/m) or FCC 15.209 which is higher.

Note 2: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

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Test Mode:	802.11b - Ant 1	Test Site:	AC1				
Test Channel:	11	Test Engineer:	Roy Cheng				
Remark:	Average measurement was not performed if peak level lower than average						
	limit.						
	2. Other frequency was 20dB below limit line within 1-18GHz, there is not show						
	in the report.						

Mark	Frequency	Reading	Factor	Measure	Limit	Margin	Detector	Polarization
	(MHz)	Level	(dB)	Level	(dBµV/m)	(dB)		
		(dBµV)		(dBµV/m)				
	7315.5	40.6	1.5	42.1	74.0	-31.9	Peak	Horizontal
	9381.0	39.4	3.2	42.6	74.0	-31.4	Peak	Horizontal
*	10401.0	40.2	4.7	44.9	84.7	-39.8	Peak	Horizontal
*	13503.5	42.6	4.8	47.4	84.7	-37.3	Peak	Horizontal
	7664.0	40.5	1.2	41.7	74.0	-32.3	Peak	Vertical
	8327.0	40.5	1.0	41.5	74.0	-32.5	Peak	Vertical
*	9738.0	40.1	3.9	44.0	84.7	-40.7	Peak	Vertical
*	13214.5	41.3	3.8	45.1	84.7	-39.6	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 30dBc of the fundamental emission level (114.7dBµV/m) or FCC 15.209 which is higher.

Note 2: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

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Test Mode:	802.11g - Ant 1	Test Site:	AC1				
Test Channel:	01	Test Engineer:	Roy Cheng				
Remark:	Average measurement was not performed if peak level lower than average						
	limit.						
	2. Other frequency was 20dB below limit line within 1-18GHz, there is not show						
	in the report.						

Mark	Frequency (MHz)	Reading Level (dBµV)	Factor (dB)	Measure Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Polarization
	7468.5	40.2	1.5	41.7	74.0	-32.3	Peak	Horizontal
	9134.5	39.4	2.4	41.8	74.0	-32.2	Peak	Horizontal
*	10044.0	39.5	4.1	43.6	85.1	-41.5	Peak	Horizontal
*	12738.5	41.3	3.0	44.3	85.1	-40.8	Peak	Horizontal
	7400.5	40.3	1.3	41.6	74.0	-32.4	Peak	Vertical
	9134.5	39.8	2.4	42.2	74.0	-31.8	Peak	Vertical
*	10273.5	39.4	4.4	43.8	85.1	-41.3	Peak	Vertical
*	12891.5	41.4	3.3	44.7	85.1	-40.4	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 30dBc of the fundamental emission level (115.1dBµV/m) or FCC 15.209 which is higher.

Note 2: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

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Test Mode:	802.11g - Ant 1	Test Site:	AC1					
Test Channel:	06	Test Engineer:	Roy Cheng					
Remark:	Average measurement was not performed if peak level lower than average							
		limit.Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.						

Mark	Frequency (MHz)	Reading Level (dBµV)	Factor (dB)	Measure Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Polarization
	7553.5	39.7	1.6	41.3	74.0	-32.7	Peak	Horizontal
	9338.5	39.2	3.2	42.4	74.0	-31.6	Peak	Horizontal
*	10290.5	34.2	12.0	46.2	86.1	-39.9	Peak	Horizontal
*	13121.0	41.9	3.7	45.6	86.1	-40.5	Peak	Horizontal
	7511.0	39.1	1.6	40.7	74.0	-33.3	Peak	Vertical
	8293.0	40.0	1.1	41.1	74.0	-32.9	Peak	Vertical
*	10078.0	32.7	11.5	44.2	86.1	-41.9	Peak	Vertical
*	13197.5	40.4	3.8	44.2	86.1	-41.9	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 30dBc of the fundamental emission level (116.1dBµV/m) or FCC 15.209 which is higher.

Note 2: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

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Test Mode:	802.11g - Ant 1	Test Site:	AC1				
Test Channel:	11	Test Engineer:	Roy Cheng				
Remark:	Average measurement was not performed if peak level lower than average						
	limit.						
	2. Other frequency was 20dB below limit line within 1-18GHz, there is not show						
	in the report.						

Mark	Frequency	Reading	Factor	Measure	Limit	Margin	Detector	Polarization
	(MHz)	Level	(dB)	Level	(dBµV/m)	(dB)		
		(dBµV)		(dBµV/m)				
	7434.5	39.0	1.4	40.4	74.0	-33.6	Peak	Horizontal
	9177.0	38.9	2.7	41.6	74.0	-32.4	Peak	Horizontal
*	10120.5	33.4	11.6	45.0	84.9	-39.9	Peak	Horizontal
*	13146.5	41.8	3.7	45.5	84.9	-39.4	Peak	Horizontal
	7264.5	39.9	1.4	41.3	74.0	-32.7	Peak	Vertical
	8216.5	39.8	1.3	41.1	74.0	-32.9	Peak	Vertical
*	9602.0	33.6	10.9	44.5	84.9	-40.4	Peak	Vertical
*	12985.0	40.9	3.5	44.4	84.9	-40.5	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 30dBc of the fundamental emission level (114.9dBµV/m) or FCC 15.209 which is higher.

Note 2: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

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Test Mode:	802.11n-HT20 - Ant 1	Test Site:	AC1			
Test Channel:	01	Test Engineer:	Roy Cheng			
Remark:	Average measurement was not performed if peak level lower than average					
	limit.					
	2. Other frequency was 20dB below limit line within 1-18GHz, there is not show					
	in the report.					

Mark	Frequency	Reading	Factor	Measure	Limit	Margin	Detector	Polarization
	(MHz)	Level	(dB)	Level	(dBµV/m)	(dB)		
		(dBµV)		(dBµV/m)				
	7570.5	40.1	1.5	41.6	74.0	-32.4	Peak	Horizontal
	9423.5	40.1	3.2	43.3	74.0	-30.7	Peak	Horizontal
*	10358.5	32.7	12.2	44.9	83.0	-38.1	Peak	Horizontal
*	12968.0	42.3	3.4	45.7	83.0	-37.3	Peak	Horizontal
	7502.5	39.6	1.6	41.2	74.0	-32.8	Peak	Vertical
	9058.0	39.7	1.8	41.5	74.0	-32.5	Peak	Vertical
*	10086.5	33.0	11.5	44.5	83.0	-38.5	Peak	Vertical
*	13214.5	40.0	3.8	43.8	83.0	-39.2	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 30dBc of the fundamental emission level (113.0dBµV/m) or FCC 15.209 which is higher.

Note 2: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

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Test Mode:	802.11n-HT20 - Ant 1	Test Site:	AC1				
Test Channel:	06	Test Engineer:	Roy Cheng				
Remark:	Average measurement was not performed if peak level lower than average limit.						
	 Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report. 						

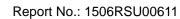
Mark	Frequency (MHz)	Reading Level (dBµV)	Factor (dB)	Measure Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Polarization
	5454.0	39.6	-2.1	37.5	74.0	-36.5	Peak	Horizontal
	7468.5	39.5	1.5	41.0	74.0	-33.0	Peak	Horizontal
*	10214.0	34.2	11.8	46.0	84.5	-38.5	Peak	Horizontal
*	12985.0	41.4	3.5	44.9	84.5	-39.6	Peak	Horizontal
	7264.5	39.9	1.4	41.3	74.0	-32.7	Peak	Vertical
	8310.0	40.3	1.0	41.3	74.0	-32.7	Peak	Vertical
*	10511.5	33.1	12.4	45.5	84.5	-39.0	Peak	Vertical
*	13129.5	41.1	3.7	44.8	84.5	-39.7	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 30dBc of the fundamental emission level (114.5dBµV/m) or FCC 15.209 which is higher.

Note 2: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

FCC ID: 2AD8UFZCWI2A1 Page Number: 85 of 219 IC: 109D-FZCWI2A01





Test Mode:	802.11n-HT20 - Ant 1	Test Site:	AC1				
Test Channel:	11	Test Engineer:	Roy Cheng				
Remark:	Average measurement was not performed if peak level lower than average limit.						
	2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.						

Mark	Frequency (MHz)	Reading Level (dBµV)	Factor (dB)	Measure Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Polarization
	8403.5	39.9	1.1	41.0	74.0	-33.0	Peak	Horizontal
	9338.5	39.0	3.2	42.2	74.0	-31.8	Peak	Horizontal
*	10443.5	39.2	4.4	43.6	81.3	-37.7	Peak	Horizontal
*	12891.5	41.4	3.3	44.7	81.3	-36.6	Peak	Horizontal
	8276.0	39.5	1.1	40.6	74.0	-33.4	Peak	Vertical
	9134.5	39.0	2.4	41.4	74.0	-32.6	Peak	Vertical
*	10503.0	33.3	12.4	45.7	81.3	-35.6	Peak	Vertical
*	12840.5	40.9	3.2	44.1	81.3	-37.2	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 30dBc of the fundamental emission level (111.3dBµV/m) or FCC 15.209 which is higher.

Note 2: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

FCC ID: 2AD8UFZCWI2A1 Page Number: 86 of 219 IC: 109D-FZCWI2A01





Test Mode:	802.11n-HT40 - Ant 1	Test Site:	AC1					
Test Channel:	03	Test Engineer:	Roy Cheng					
Remark:	1. Average measurement was no	ot performed if peak	level lower than average					
	limit.	limit.						
	2. Other frequency was 20dB below limit line within 1-18GHz, there is not show							
	in the report.							

Mark	Frequency	Reading	Factor	Measure	Limit	Margin	Detector	Polarization
	(MHz)	Level	(dB)	Level	(dBµV/m)	(dB)		
		(dBµV)		(dBµV/m)				
	7587.5	39.9	1.5	41.4	74.0	-32.6	Peak	Horizontal
	9177.0	39.0	2.7	41.7	74.0	-32.3	Peak	Horizontal
*	10503.0	33.3	12.4	45.7	77.9	-32.2	Peak	Horizontal
*	13010.5	39.0	3.5	42.5	77.9	-35.4	Peak	Horizontal
	8310.0	39.4	1.0	40.4	74.0	-33.6	Peak	Vertical
	9466.0	38.9	3.2	42.1	74.0	-31.9	Peak	Vertical
*	10571.0	32.6	12.4	45.0	77.9	-32.9	Peak	Vertical
*	13036.0	40.6	3.6	44.2	77.9	-33.7	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 30dBc of the fundamental emission level (107.9dBµV/m) or FCC 15.209 which is higher.

Note 2: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

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Test Mode:	802.11n-HT40 - Ant 1	Test Site:	AC1					
Test Channel:	06	Test Engineer:	Roy Cheng					
Remark:	1. Average measurement was no	t performed if peak	level lower than average					
	limit.							
	2. Other frequency was 20dB below limit line within 1-18GHz, there is not show							
	in the report.							

Mark	Frequency	Reading	Factor	Measure	Limit	Margin	Detector	Polarization
	(MHz)	Level	(dB)	Level	(dBµV/m)	(dB)		
		(dBµV)		(dBµV/m)				
	7307.0	38.8	1.5	40.3	74.0	-33.7	Peak	Horizontal
	9338.5	39.0	3.2	42.2	74.0	-31.8	Peak	Horizontal
*	10469.0	38.9	4.5	43.4	82.3	-38.9	Peak	Horizontal
*	13860.5	40.3	5.4	45.7	82.3	-36.6	Peak	Horizontal
	7621.5	39.1	1.4	40.5	74.0	-33.5	Peak	Vertical
	8403.5	40.2	1.1	41.3	74.0	-32.7	Peak	Vertical
*	10443.5	38.4	4.4	42.8	82.3	-39.5	Peak	Vertical
*	13129.5	41.1	3.7	44.8	82.3	-37.5	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 30dBc of the fundamental emission level (112.3dBµV/m) or FCC 15.209 which is higher.

Note 2: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

FCC ID: 2AD8UFZCWI2A1 Page Number: 88 of 219 IC: 109D-FZCWI2A01





Test Mode:	802.11n-HT40 - Ant 1	Test Site:	AC1					
Test Channel:	09	Test Engineer:	Roy Cheng					
Remark:	1. Average measurement was no	t performed if peak	level lower than average					
	limit.	limit.						
	2. Other frequency was 20dB below limit line within 1-18GHz, there is not show							
	in the report.							

Mark	Frequency (MHz)	Reading Level (dBµV)	Factor (dB)	Measure Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Polarization
	7468.5	38.9	1.5	40.4	74.0	-33.6	Peak	Horizontal
	9347.0	38.5	3.2	41.7	74.0	-32.3	Peak	Horizontal
*	10384.0	32.6	12.3	44.9	78.0	-33.1	Peak	Horizontal
*	12900.0	41.3	3.3	44.6	78.0	-33.4	Peak	Horizontal
	7570.5	38.9	1.5	40.4	74.0	-33.6	Peak	Vertical
	8242.0	39.4	1.2	40.6	74.0	-33.4	Peak	Vertical
*	10307.5	38.6	4.5	43.1	78.0	-34.9	Peak	Vertical
*	13206.0	39.6	3.8	43.4	78.0	-34.6	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 30dBc of the fundamental emission level (108.0dBµV/m) or FCC 15.209 which is higher.

Note 2: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

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Test Mode:	802.11b - Ant 2	Test Site:	AC1					
Test Channel:	01	Test Engineer:	Roy Cheng					
Remark:	1. Average measurement was no	t performed if peak	evel lower than average					
	limit.	limit.						
	2. Other frequency was 20dB bel	ow limit line within 1	-18GHz, there is not show					
	in the report.							

Mark	Frequency	Reading	Factor	Measure	Limit	Margin	Detector	Polarization
	(MHz)	Level	(dB)	Level	(dBµV/m)	(dB)		
		(dBµV)		(dBµV/m)				
	8310.0	40.9	1.0	41.9	74.0	-32.1	Peak	Horizontal
	9134.5	38.7	2.4	41.1	74.0	-32.9	Peak	Horizontal
*	10443.5	39.4	4.4	43.8	82.0	-38.2	Peak	Horizontal
*	13486.5	41.0	4.7	45.7	82.0	-36.3	Peak	Horizontal
	7460.0	38.3	1.5	39.8	74.0	-34.2	Peak	Vertical
	8335.5	40.3	1.0	41.3	74.0	-32.7	Peak	Vertical
*	9789.0	38.0	4.1	42.1	82.0	-39.9	Peak	Vertical
*	12789.5	40.1	3.2	43.3	82.0	-38.7	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 30dBc of the fundamental emission level (112.0dBµV/m) or FCC 15.209 which is higher.

Note 2: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

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Test Mode:	802.11b - Ant 2	Test Site:	AC1					
Test Channel:	06	Test Engineer:	Roy Cheng					
Remark:	1. Average measurement was no	t performed if peak l	evel lower than average					
	limit.	limit.						
	2. Other frequency was 20dB bel	ow limit line within 1	-18GHz, there is not show					
	in the report.							

Mark	Frequency	Reading	Factor	Measure	Limit	Margin	Detector	Polarization
	(MHz)	Level	(dB)	Level	(dBµV/m)	(dB)		
		(dBµV)		(dBµV/m)				
	7689.5	39.7	1.2	40.9	74.0	-33.1	Peak	Horizontal
	9432.0	38.1	3.2	41.3	74.0	-32.7	Peak	Horizontal
*	10503.0	32.5	12.4	44.9	82.7	-37.8	Peak	Horizontal
*	12951.0	41.1	3.4	44.5	82.7	-38.2	Peak	Horizontal
	7417.5	39.3	1.3	40.6	74.0	-33.4	Peak	Vertical
	8318.5	39.3	1.0	40.3	74.0	-33.7	Peak	Vertical
*	10358.5	32.5	12.2	44.7	82.7	-38.0	Peak	Vertical
*	13070.0	40.7	3.6	44.3	82.7	-38.4	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 30dBc of the fundamental emission level (112.7dBµV/m) or FCC 15.209 which is higher.

Note 2: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

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Test Mode:	802.11b - Ant 2	Test Site:	AC1					
Test Channel:	11	Test Engineer:	Roy Cheng					
Remark:	1. Average measurement was no	t performed if peak	level lower than average					
	limit.	limit.						
	2. Other frequency was 20dB bel	ow limit line within 1	-18GHz, there is not show					
	in the report.							

Mark	Frequency	Reading	Factor	Measure	Limit	Margin	Detector	Polarization
	(MHz)	Level	(dB)	Level	(dBµV/m)	(dB)		
		(dBµV)		(dBµV/m)				
	7273.0	40.8	1.4	42.2	74.0	-31.8	Peak	Horizontal
	8242.0	41.2	1.2	42.4	74.0	-31.6	Peak	Horizontal
*	10783.5	32.9	12.6	45.5	83.2	-37.7	Peak	Horizontal
*	13146.5	41.7	3.7	45.4	83.2	-37.8	Peak	Horizontal
	7366.5	39.4	1.4	40.8	74.0	-33.2	Peak	Vertical
	8063.5	38.7	1.8	40.5	74.0	-33.5	Peak	Vertical
*	10120.5	39.2	4.1	43.3	83.2	-39.9	Peak	Vertical
*	12891.5	40.7	3.3	44.0	83.2	-39.2	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 30dBc of the fundamental emission level (113.2dBµV/m) or FCC 15.209 which is higher.

Note 2: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

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Test Mode:	802.11g - Ant 2	Test Site:	AC1					
Test Channel:	01	Test Engineer:	Roy Cheng					
Remark:	Average measurement was not performed if peak level lower than average							
	limit.							
	2. Other frequency was 20dB below limit line within 1-18GHz, there is not show							
	in the report.							

Mark	Frequency	Reading	Factor	Measure	Limit	Margin	Detector	Polarization
	(MHz)	Level	(dB)	Level	(dBµV/m)	(dB)		
		(dBµV)		(dBµV/m)				
	8276.0	40.2	1.1	41.3	74.0	-32.7	Peak	Horizontal
	9304.5	39.8	3.1	42.9	74.0	-31.1	Peak	Horizontal
*	10214.0	38.8	4.3	43.1	83.3	-40.2	Peak	Horizontal
*	13495.0	41.0	4.7	45.7	83.3	-37.6	Peak	Horizontal
	8089.0	38.9	1.7	40.6	74.0	-33.4	Peak	Vertical
	9143.0	38.1	2.4	40.5	74.0	-33.5	Peak	Vertical
*	9942.0	38.1	4.0	42.1	83.3	-41.2	Peak	Vertical
*	12849.0	42.8	3.3	46.1	83.3	-37.2	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 30dBc of the fundamental emission level (113.3dBµV/m) or FCC 15.209 which is higher.

Note 2: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

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Test Mode:	802.11g - Ant 2	Test Site:	AC1						
Test Channel:	06	Test Engineer:	Roy Cheng						
Remark:	Average measurement was no limit.	. Average measurement was not performed if peak level lower than average							
	Other frequency was 20dB bel in the report.	ow limit line within 1	-18GHz, there is not show						

Mark	Frequency (MHz)	Reading Level (dBµV)	Factor (dB)	Measure Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Polarization
	7426.0	38.2	1.3	39.5	74.0	-34.5	Peak	Horizontal
	8199.5	40.1	1.4	41.5	74.0	-32.5	Peak	Horizontal
*	9568.0	33.3	10.9	44.2	83.2	-39.0	Peak	Horizontal
*	12985.0	39.4	3.5	42.9	83.2	-40.3	Peak	Horizontal
	7264.5	38.8	1.4	40.2	74.0	-33.8	Peak	Vertical
	8471.5	40.0	1.2	41.2	74.0	-32.8	Peak	Vertical
*	10494.5	32.5	12.4	44.9	83.2	-38.3	Peak	Vertical
*	13061.5	42.1	3.6	45.7	83.2	-37.5	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 30dBc of the fundamental emission level (113.2dBµV/m) or FCC 15.209 which is higher.

Note 2: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

FCC ID: 2AD8UFZCWI2A1 Page Number: 94 of 219 IC: 109D-FZCWI2A01





Test Mode:	802.11g - Ant 2	Test Site:	AC1						
Test Channel:	11	Test Engineer:	Roy Cheng						
Remark:	Average measurement was not performed if peak level lower than average								
	limit.	limit.							
	2. Other frequency was 20dB below limit line within 1-18GHz, there is not show								
	in the report.								

Mark	Frequency	Reading	Factor	Measure	Limit	Margin	Detector	Polarization
	(MHz)	Level	(dB)	Level	(dBµV/m)	(dB)		
		(dBµV)		(dBµV/m)				
	7672.5	39.4	1.2	40.6	74.0	-33.4	Peak	Horizontal
	9177.0	38.1	2.7	40.8	74.0	-33.2	Peak	Horizontal
*	9772.0	31.8	11.4	43.2	82.8	-39.6	Peak	Horizontal
*	12781.0	40.1	3.1	43.2	82.8	-39.6	Peak	Horizontal
	7349.5	39.4	1.4	40.8	74.0	-33.2	Peak	Vertical
	8131.5	40.1	1.6	41.7	74.0	-32.3	Peak	Vertical
*	10341.5	32.2	12.2	44.4	82.8	-38.4	Peak	Vertical
*	12840.5	39.8	3.2	43.0	82.8	-39.8	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 30dBc of the fundamental emission level (112.8dBµV/m) or FCC 15.209 which is higher.

Note 2: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

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Test Mode:	802.11n-HT20 - Ant 2	Test Site:	AC1						
Test Channel:	01	Test Engineer:	Roy Cheng						
Remark:	Average measurement was not performed if peak level lower than average								
	limit.	limit.							
	2. Other frequency was 20dB below limit line within 1-18GHz, there is not show								
	in the report.								

Mark	Frequency (MHz)	Reading Level (dBµV)	Factor (dB)	Measure Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Polarization
	7638.5	40.3	1.3	41.6	74.0	-32.4	Peak	Horizontal
	9160.0	39.0	2.6	41.6	74.0	-32.4	Peak	Horizontal
*	10290.5	34.0	12.0	46.0	81.5	-35.5	Peak	Horizontal
*	13070.0	40.3	3.6	43.9	81.5	-37.6	Peak	Horizontal
	8063.5	40.1	1.8	41.9	74.0	-32.1	Peak	Vertical
	9177.0	38.8	2.7	41.5	74.0	-32.5	Peak	Vertical
*	10392.5	31.9	12.3	44.2	81.5	-37.3	Peak	Vertical
*	12908.5	41.6	3.3	44.9	81.5	-36.6	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 30dBc of the fundamental emission level (111.5dBµV/m) or FCC 15.209 which is higher.

Note 2: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

FCC ID: 2AD8UFZCWI2A1 Page Number: 96 of 219 IC: 109D-FZCWI2A01





Test Mode:	802.11n-HT20 - Ant 2	Test Site:	AC1						
Test Channel:	06	Test Engineer:	Roy Cheng						
Remark:	Average measurement was not performed if peak level lower than average								
	limit.	limit.							
	2. Other frequency was 20dB below limit line within 1-18GHz, there is not show								
	in the report.								

Mark	Frequency	Reading	Factor	Measure	Limit	Margin	Detector	Polarization
	(MHz)	Level	(dB)	Level	(dBµV/m)	(dB)		
		(dBµV)		(dBµV/m)				
	5037.5	40.3	-2.2	38.1	74.0	-35.9	Peak	Horizontal
	7732.0	40.3	1.3	41.6	74.0	-32.4	Peak	Horizontal
*	8616.0	39.9	1.7	41.6	82.3	-40.7	Peak	Horizontal
*	9814.5	38.1	4.2	42.3	82.3	-40.0	Peak	Horizontal
	7553.5	39.6	1.6	41.2	74.0	-32.8	Peak	Vertical
	8250.5	40.0	1.2	41.2	74.0	-32.8	Peak	Vertical
*	9534.0	39.4	3.4	42.8	82.3	-39.5	Peak	Vertical
*	10443.5	38.9	4.4	43.3	82.3	-39.0	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 30dBc of the fundamental emission level (112.3dBµV/m) or FCC 15.209 which is higher.

Note 2: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

FCC ID: 2AD8UFZCWI2A1 Page Number: 97 of 219 IC: 109D-FZCWI2A01





Test Mode:	802.11n-HT20 - Ant 2	Test Site:	AC1						
Test Channel:	11	Test Engineer:	Roy Cheng						
Remark:	1. Average measurement was no	. Average measurement was not performed if peak level lower than average							
	limit.								
	2. Other frequency was 20dB bel	2. Other frequency was 20dB below limit line within 1-18GHz, there is not show							
	in the report.								

Mark	Frequency	Reading	Factor	Measure	Limit	Margin	Detector	Polarization
	(MHz)	Level	(dB)	Level	(dBµV/m)	(dB)		
		(dBµV)		(dBµV/m)				
	4842.0	40.5	-2.5	38.0	74.0	-36.0	Peak	Horizontal
	7298.5	38.9	1.5	40.4	74.0	-33.6	Peak	Horizontal
*	8862.5	39.0	2.0	41.0	82.0	-41.0	Peak	Horizontal
*	10163.0	33.5	11.7	45.2	82.0	-36.8	Peak	Horizontal
	8488.5	39.6	1.3	40.9	74.0	-33.1	Peak	Vertical
	9338.5	38.5	3.2	41.7	74.0	-32.3	Peak	Vertical
*	10443.5	38.1	4.4	42.5	82.0	-39.5	Peak	Vertical
*	12891.5	40.4	3.3	43.7	82.0	-38.3	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 30dBc of the fundamental emission level (112.0dBµV/m) or FCC 15.209 which is higher.

Note 2: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

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Test Mode:	802.11n-HT40 - Ant 2	Test Site:	AC1			
Test Channel:	03	Test Engineer:	Roy Cheng			
Remark:	Average measurement was not performed if peak level lower than average					
	limit.					
	2. Other frequency was 20dB below limit line within 1-18GHz, there is not show					
	in the report.					

Mark	Frequency	Reading	Factor	Measure	Limit	Margin	Detector	Polarization
	(MHz)	Level	(dB)	Level	(dBµV/m)	(dB)		
		(dBµV)		(dBµV/m)				
	7604.5	41.1	1.4	42.5	74.0	-31.5	Peak	Horizontal
	9109.0	39.7	2.1	41.8	74.0	-32.2	Peak	Horizontal
*	10554.0	32.0	12.5	44.5	76.8	-32.3	Peak	Horizontal
*	12857.5	41.3	3.3	44.6	76.8	-32.2	Peak	Horizontal
	7426.0	38.7	1.3	40.0	74.0	-34.0	Peak	Vertical
	9015.5	38.7	1.7	40.4	74.0	-33.6	Peak	Vertical
*	10503.0	39.0	4.8	43.8	76.8	-33.0	Peak	Vertical
*	13078.5	41.1	3.7	44.8	76.8	-32.0	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 30dBc of the fundamental emission level (106.8dBµV/m) or FCC 15.209 which is higher.

Note 2: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

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Test Mode:	802.11n-HT40 - Ant 2	Test Site:	AC1			
Test Channel:	06	Test Engineer:	Roy Cheng			
Remark:	Average measurement was not performed if peak level lower than average					
	limit.					
	2. Other frequency was 20dB below limit line within 1-18GHz, there is not show					
	in the report.					

Mark	Frequency (MHz)	Reading Level	Factor (dB)	Measure Level	Limit (dBµV/m)	Margin (dB)	Detector	Polarization
		(dBµV)		(dBµV/m)				
	7536.5	38.6	1.6	40.2	74.0	-33.8	Peak	Horizontal
	8318.5	39.9	1.0	40.9	74.0	-33.1	Peak	Horizontal
*	10239.5	39.3	4.4	43.7	72.1	-28.4	Peak	Horizontal
*	12968.0	41.1	3.4	44.5	72.1	-27.6	Peak	Horizontal
	7281.5	39.0	1.4	40.4	74.0	-33.6	Peak	Vertical
	9100.5	38.5	2.1	40.6	74.0	-33.4	Peak	Vertical
*	10367.0	39.5	4.6	44.1	72.1	-28.0	Peak	Vertical
*	13189.0	39.6	3.8	43.4	72.1	-28.7	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 30dBc of the fundamental emission level (102.1dBµV/m) or FCC 15.209 which is higher.

Note 2: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

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