

Marker	Frequenc y (GHz)	Meter Reading (dBm)	Det	AF T711 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Conversi on Factor (dB)	Correcte d Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.85	-66.77	Pk	34.9	-19.5	11.8	-39.57	26.94	-66.51	7	101	V
2	5.966	-64.15	Pk	35	-19	11.8	-36.35	-27	-9.35	7	101	V

Pk - Peak detector

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HARMONICS AND SPURIOUS EMISSIONS





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Marke r	Frequ ency (GHz)	Meter Readi ng (dBuV)	Det	AF T712 (dB/m)	Amp/C bl/Fltr/ Pad (dB)	DC Corr (dB)	Correc ted Readi ng (dBuV/ m)	Avg Limit (dBuV/ m)	Margi n (dB)	Peak Limit (dBuV/ m)	PK Margin (dB)	UNII Non- Restri cted (dBuV/ m)	PK Margin (dB)	Azimu th (Degs)	Height (cm)	Polarit y
1	* 3.62	39.44	PK-U	33.3	-28.8	0	43.94	-	-	74	-30.06	-	-	36	135	Н
	* 3.621	29.36	ADR	33.3	-28.8	.21	34.07	54	-19.93	-	-	-	-	36	135	H
2	* 3.824	39.21	PK-U	33.5	-28.5	0	44.21	-	-	74	-29.79	-	-	108	157	V
	* 3.827	29.48	ADR	33.5	-28.5	.21	34.69	54	-19.31	-	-	-	-	108	157	V
4	* 12.08	35.31	PK-U	39	-21.3	0	53.01	-	-	74	-20.99	-	-	89	108	Н
	* 12.08	25.5	ADR	39	-21.3	.21	43.41	54	-10.59	-	-	-	-	89	108	Н
5	* 7.34	36.91	PK-U	35.6	-25.5	0	47.01	-	-	74	-26.99	-	-	210	287	V
	* 7.342	26.75	ADR	35.6	-25.4	.21	37.16	54	-16.84	-	-	-	-	210	287	V
3	6.234	38.31	PK-U	35.6	-26.3	0	47.61	-	-	-	-	68.2	-20.59	70	208	Н
6	9.526	35.26	PK-U	36.6	-21.5	0	50.36	-	-	-	-	68.2	-17.84	89	113	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band PK-U - U-NII: Maximum Peak

ADR - U-NII AD primary method, RMS average

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9.2.45. 11ac HT80 2TX CDD MIMO MODE IN THE 5.8GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)



Marker	Frequen cy (GHz)	Meter Reading (dBm)	Det	AF T711 (dB/m)	Amp/Cb I/Fltr/Pa d (dB)	Convers ion Factor (dB)	DC Corr (dB)	Correct ed Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	5.651	-58.67	Pk	34.8	-19.5	11.8	0	-31.57	-26.36	-5.21	81	139	Н
1	5.725	-51.4	Pk	34.9	-19.6	11.8	0	-24.3	26.97	-51.27	81	139	Н

Pk - Peak detector

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Marker	Frequen cy (GHz)	Meter Reading (dBm)	Det	AF T711 (dB/m)	Amp/Cb I/Fltr/Pa d (dB)	Convers ion Factor (dB)	DC Corr (dB)	Correct ed Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.725	-61.45	Pk	34.9	-19.6	11.8	0	-34.35	26.97	-61.32	73	110	V
2	5.648	-63.88	Pk	34.8	-19.5	11.8	0	-36.78	-27	-9.78	73	110	V

Pk - Peak detector

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RESTRICTED BANDEDGE (HIGH CHANNEL)



Marker	Frequen cy (GHz)	Meter Reading (dBm)	Det	AF T711 (dB/m)	Amp/Cb I/Fltr/Pa d (dB)	Convers ion Factor (dB)	DC Corr (dB)	Correct ed Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.85	-59.78	Pk	34.9	-19.5	11.8	0	-32.58	26.94	-59.52	83	128	Н
2	5.927	-59.56	Pk	35	-19.2	11.8	0	-31.96	-27	-4.96	83	128	Н

Pk - Peak detector

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Marker	Frequen cy (GHz)	Meter Reading (dBm)	Det	AF T711 (dB/m)	Amp/Cb I/Fltr/Pa d (dB)	Conver sion Factor (dB)	DC Corr (dB)	Correct ed Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.85	-66.21	Pk	34.9	-19.5	11.8	0	-39.01	26.94	-65.95	138	314	V
2	5.941	-64.2	Pk	35	-19.3	11.8	0	-36.7	-27	-9.7	138	314	V

Pk - Peak detector

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HARMONICS AND SPURIOUS EMISSIONS





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Marke rs	Freque ncy (GHz)	Meter Readi ng (dBu V)	Det	AF T712 (dB/m)	Amp/C bl/Fltr/ Pad (dB)	DC Corr (dB)	Correc ted Readi ng (dBuV/ m)	Avg Limit (dBuV/ m)	Margin (dB)	Peak Limit (dBuV/ m)	PK Margin (dB)	UNII Non- Restri cted (dBuV/ m)	PK Margin (dB)	Azimu th (Degs)	Height (cm)	Polarit y
1	* 1.405	41.15	PK-U	28.9	-31.2	0	38.85	-	-	74	-35.15			49	115	Н
	* 1.405	29.74	ADR	28.9	-31.2	.2	27.64	54	-26.36	-	-	-	-	49	115	н
2	* 4.118	38.28	PK-U	33.6	-28.3	0	43.58	-	-	74	-30.42			99	131	Н
	* 4.118	27.8	ADR	33.6	-28.3	.2	33.3	54	-20.7	-	-		-	99	131	H
3	* 1.343	40.13	PK-U	28.9	-31.3	0	37.73	-	-	74	-36.27			155	170	V
	* 1.342	30.11	ADR	28.9	-31.3	.2	27.91	54	-26.09	-	-	-	-	155	170	V
4	* 3.813	38.67	PK-U	33.6	-28.5	0	43.77	-	-	74	-30.23			123	186	V
	* 3.812	27.74	ADR	33.6	-28.5	.2	33.04	54	-20.96	-	-	-	-	123	186	V
5	* 10.762	34.35	PK-U	37.9	-20.7	0	51.55	-	-	74	-22.45			179	167	Н
	* 10.763	23.42	ADR	37.9	-20.7	.2	40.82	54	-13.18	-	-	-	-	179	167	Н
6	* 12.097	35.09	PK-U	39	-21.2	0	52.89	-	-	74	-21.11	-	-	239	217	V
	* 12.097	23.86	ADR	39	-21.1	.2	41.96	54	-12.04	-	-	-	-	239	217	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK-U - U-NII: Maximum Peak

ADR - U-NII AD primary method, RMS average

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9.3. RADIATION CO-LOCATION

BLUETOOTH AND 802.11 HT20 2Tx CDD MODE IN THE 5.6GHz BAND





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DATA

Marker	Frequen cy (GHz)	Meter Reading (dBuV)	Det	AF T344 (dB/m)	Amp/Cbl /Fltr/Pad (dB)	Correcte d Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.2	41.54	PK-U	31.9	-21	52.44	53.97	-1.53	74	-21.56	130	360	н
	2.199	30.4	ADR	31.9	-21	41.3	53.97	-12.67	-	-	130	360	н
4	* 2.216	41.48	PK-U	31.9	-21	52.38	53.97	-1.59	74	-21.62	170	267	V
	* 2.216	30.19	ADR	31.9	-21	41.09	53.97	-12.88	-	-	170	267	V
2	* 4.249	38.46	PK-U	33.7	-28.1	44.06	53.97	-9.91	74	-29.94	90	144	н
	* 4.248	27.4	ADR	33.7	-28.1	33	53.97	-20.97	-	-	90	144	Н
5	* 4.603	37.81	PK-U	34.1	-27.8	44.11	53.97	-9.86	74	-29.89	24	236	V
	* 4.603	27.14	ADR	34.1	-27.8	33.44	53.97	-20.53	-	-	24	236	V
3	* 7.261	36.13	PK-U	35.5	-25.3	46.33	53.97	-7.64	74	-27.67	9	201	н
	* 7.262	25.51	ADR	35.5	-25.3	35.71	53.97	-18.26	-	-	9	201	Н
6	* 8.114	36.74	PK-U	35.7	-24.7	47.74	53.97	-6.23	74	-26.26	189	392	V
	* 8.115	25.07	ADR	35.7	-24.7	36.07	53.97	-17.9	-	-	189	392	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK-U - U-NII: Maximum Peak

ADR - U-NII AD primary method, RMS average

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BLUETOOTH LOW ENERGY AND 802.11 HT20 2Tx CDD MODE IN THE 5.6GHz BAND





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DATA

Marker	Frequen cy (GHz)	Meter Reading (dBuV)	Det	AF T344 (dB/m)	Amp/Cbl /Fltr/Pad (dB)	Correcte d Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.244	41.39	PK-U	31.8	-21	52.19	53.97	-1.78	74	-21.81	216	194	н
	* 2.243	30.43	ADR	31.8	-21	41.23	-	-	-	-	216	194	н
2	2.938	41.65	PK-U	32.7	-20.4	53.95	53.97	02	74	-20.05	14	377	Н
	2.937	30.25	ADR	32.7	-20.4	42.55	-	-	-	-	14	377	Н
4	* 2.345	42.23	PK-U	31.9	-21	53.13	53.97	84	74	-20.87	261	243	V
	* 2.347	30.38	ADR	31.9	-21	41.28	-	-	-	-	261	243	V
5	2.942	41.23	PK-U	32.7	-20.4	53.53	53.97	44	74	-20.47	94	132	V
	2.94	30.28	ADR	32.7	-20.4	42.58	-	-	-	-	94	132	V
3	* 4.88	41.86	PK-U	34.1	-27.8	48.16	53.97	-5.81	74	-25.84	308	251	н
	* 4.88	34.04	ADR	34.1	-27.8	40.34	-	-	-	-	308	251	Н
6	* 4.88	41.57	PK-U	34.1	-27.8	47.87	53.97	-6.1	74	-26.13	248	125	V
	* 4.88	33.88	ADR	34.1	-27.8	40.18	-	-	-	-	248	125	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK-U - U-NII: Maximum Peak

ADR - U-NII AD primary method, RMS average

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9.4. WORST-CASE BELOW 1 GHz

SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION)





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DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T243 (dB/m)	Amp/Cbl (dB)	Correcte d Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	* 109.7725	41.14	Pk	16.7	-31.3	26.54	43.52	-16.98	0-360	100	V
6	* 243.2	39.28	Pk	15.6	-30.6	24.28	46.02	-21.74	0-360	100	Н
1	30.9775	31.68	Pk	24.6	-31.9	24.38	40	-15.62	0-360	100	V
2	36.6725	33.21	Pk	20.3	-31.8	21.71	40	-18.29	0-360	100	V
4	62.8525	36.01	Pk	11.6	-31.6	16.01	40	-23.99	0-360	299	Н
5	82.7425	41.36	Pk	11.3	-31.5	21.16	40	-18.84	0-360	399	Н
7	530.8	30.98	Pk	21.9	-29.6	23.28	46.02	-22.74	0-360	100	Н

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

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9.5. WORST-CASE 18 to 26 GHz

SPURIOUS EMISSIONS 18 TO 26 GHz (WORST-CASE CONFIGURATION, HORIZONTAL & VERTICAL)

UL EMC	21 Nov 2016 22:19:32
	RF Emissions
	Project Number:16123014 Configuration:EUT Only Mode:UNII Worst Case Tested by / SN:30606
Peak Limit (dBuV/m)	
Avg Limit (dBuV/m)	
	2 2
man & Man group and man and the man	Malan and a start and a star
3	Frequency (GHz)
8 Ronge (SH2) - Rei/VISU - Rei/VIII Det/ 1:18-26 1M(-3dB)/2M 97/0 PCR/ -	Erequency (GHz) Sweep Pts Kowportbook Label 1680weec(Ruto) 1322 H60H Horizontal Renge (GHz) RBU/UBU Ref/Hith Det/ Sweep Pts Kowportbook Label



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DATA

Marker	Frequenc Y (GHz)	Meter Reading (dBuV)	Det	AF T449 (dB/m)	Amp/Cbl (dB)	Dist Corr (dB)	Correcte d Reading (dBuVolt s)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)
1	18.326	41.73	Pk	32.4	-25.3	-9.5	39.33	54	-14.67	74	-34.67
2	20.851	41.73	Pk	33	-25.4	-9.5	39.83	54	-14.17	74	-34.17
3	25.014	44.63	Pk	34.2	-24.5	-9.5	44.83	54	-9.17	74	-29.17
4	18.5	41.6	Pk	32.6	-25.7	-9.5	39	54	-15	74	-35
5	21.031	42.2	Pk	33.1	-25.3	-9.5	40.5	54	-13.5	74	-33.5
6	23.888	43.43	Pk	33.9	-24	-9.5	43.83	54	-10.17	74	-30.17

Pk - Peak detector

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9.6. WORST-CASE 26 to 40 GHz

SPURIOUS EMISSIONS 26 TO 40 GHz (WORST-CASE CONFIGURATION)

5	21 Nov 2016 23:08:39
-	RF Emissions
5	Project Number:16U23014 Configurention:EUT Only Mode:UNII Worst Case Tested by / SN:30606
Peak Limit (dBuU/m)	
5	
5 Avg Limit (dBuV/m)	
1	
5/1000000000000000000000000000000000000	and have marked and the second and t
5 5	and have made and the second and the
5 5 5	and have been and the second and the
15 15 18	Frequency (GHz)

UL EMC			21 Nov 2016 23:08:39
		RF Emissions	
5		Project Number:16U23014 Configuration:EUT Only Mode:UNII Worst Case Tested by / SN:30606	
5			
5 Peak Limit (dBuV/m)			
5			
5 Avg Limit (dBuV/m)			
			-
54	5		6
5 WWWWWWWWW	man man	where we are a start and a	man and the man and the second second
5	man man	and the second and the second and the second s	Mary Mary Mary Mary Mary Mary Mary
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	m m m	and the second and the	un and a second s
5 5	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	and a second and a s	and the second
5			un and a second s
5			26 26
5 5 5 5 18	Frequency	y (GHz)	26
5 5 5 18 Range (SHz) RSH/RSH Ref/Htm Det/	Frequency	и (GHz) в (GHz) Rege (Stc) RBU06U Ref.Run Det. 216-26 191-360/29 97/0 97/0 РЕК/-	26 Seeg Pts Ksev/Kes Leter 168ese(Suto) 1282 H601 Vertical

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DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T449 (dB/m)	Amp/Cbl (dB)	Dist Corr (dB)	Corrected Reading (dBuVolts)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)
1	19.785	47.33	Pk	32.7	-24.7	-9.5	45.83	54	-8.17	74	-28.17
2	21.217	46.03	Pk	33.1	-24.8	-9.5	44.83	54	-9.17	74	-29.17
3	25.167	45.27	Pk	34.3	-24.9	-9.5	45.17	54	-8.83	74	-28.83
4	19.499	47.23	Pk	32.7	-25.1	-9.5	45.33	54	-8.67	74	-28.67
5	20.565	47.33	Pk	32.9	-25.4	-9.5	45.33	54	-8.67	74	-28.67
6	24.921	45.5	Pk	34.2	-24.2	-9.5	46	54	-8	74	-28

Pk - Peak detector

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10. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 8.8

Frequency of Emission (MHz)	Conducted Limit (dBµV)			
	Quasi-peak	Average		
0.15-0.5	66 to 56 *	56 to 46 *		
0.5-5	56	46		
5-30	60	50		

*Decreases with the logarithm of the frequency.

TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.10.

The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

Line conducted data is recorded for both NEUTRAL and HOT lines.

<u>RESULTS</u>

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10.1. EUT POWERED BY AC/DC ADAPTER VIA USB CABLE



LINE 1 RESULTS

WORST EMISSIONS

Range	e 1: Line-L1	.15 - 30	MHz								
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN L1	LC Cables 1&3	Limiter (dB)	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR)Margin (dB)
1	.16125	28.7	Qp	0	0	10.1	38.8	65.4	-26.6	-	-
2	.16125	20.04	Ca	0	0	10.1	30.14	-	-	55.4	-25.26
3	.5865	27.19	Qp	0	0	10.1	37.29	56	-18.71	-	-
4	.5865	19.78	Ca	0	0	10.1	29.88	-	-	46	-16.12
5	1.5945	16.03	Qp	0	.1	10.1	26.23	56	-29.77	-	-
6	1.59225	9.93	Ca	0	.1	10.1	20.13	-	-	46	-25.87
7	7.48725	13.91	Qp	0	.1	10.2	24.21	60	-35.79	-	-
8	7.48388	9.21	Ca	0	.1	10.2	19.51	-	-	50	-30.49
9	16.14075	8.33	Qp	0	.2	10.3	18.83	60	-41.17	-	-
10	16.14075	7.6	Ca	0	.2	10.3	18.1	-	-	50	-31.9
11	23.1315	15.95	Qp	.1	.2	10.4	26.65	60	-33.35	-	-
12	23.1315	13.4	Ca	.1	.2	10.4	24.1	-	-	50	-25.9

Qp - Quasi-Peak detector

Ca - CISPR average detection

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LINE 2 RESULTS



WORST EMISSIONS

Range	e 2: Line-L2	2 .15 - 30	MHz								
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN L2	LC Cables 2&3	Limiter (dB)	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR)Margin (dB)
13	.16125	28.29	Qp	0	0	10.1	38.39	65.4	-27.01	-	-
14	.16125	18.56	Ca	0	0	10.1	28.66	-	-	55.4	-26.74
15	.591	22.81	Qp	0	0	10.1	32.91	56	-23.09	-	-
16	.58875	13.13	Ca	0	0	10.1	23.23	-	-	46	-22.77
17	1.212	7.91	Qp	0	0	10.1	18.01	56	-37.99	-	-
18	1.212	2.3	Ca	0	0	10.1	12.4	-	-	46	-33.6
19	7.116	18.15	Qp	0	.1	10.2	28.45	60	-31.55	-	-
20	7.1205	13.3	Ca	0	.1	10.2	23.6	-	-	50	-26.4
21	16.1385	14.43	Qp	0	.2	10.3	24.93	60	-35.07	-	-
22	16.1385	13.21	Ca	0	.2	10.3	23.71	-	-	50	-26.29
23	27.16125	11.27	Qp	.1	.3	10.5	22.17	60	-37.83	-	-
24	27.1635	8.28	Ca	.1	.3	10.5	19.18	-	-	50	-30.82

Qp - Quasi-Peak detector

Ca - CISPR average detection

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10.2. EUT POWERED BY HOST PC VIA USB CABLE



LINE 1 RESULTS

WORST EMISSIONS

Range	e 1: Line-L1	1 .15 - 30	MHz								
Marker	Frequency (MHz)	Meter Reading	Det	LISN L1	LC Cables	Limiter (dB)	Corrected Reading	CFR 47 Part 15	QP Margin	CFR 47 Part 15	Av(CISPR)Margin
		(dBuV)			1&3		dBuVັ	Class B QP	(dB)	Class B Avg	(dB)
1	.19275	45.94	Qp	0	0	10.1	56.04	63.92	-7.88	-	-
2	.1995	29.32	Ca	0	0	10.1	39.42	-	-	53.63	-14.21
3	.915	14.01	Qp	0	0	10.1	24.11	56	-31.89	-	-
4	.90375	3.49	Ca	0	0	10.1	13.59	-	-	46	-32.41
5	3.7545	27.68	Qp	0	.1	10.1	37.88	56	-18.12	-	-
6	3.75225	14.85	Ca	0	.1	10.1	25.05	-	-	46	-20.95
7	6.80775	12.3	Qp	0	.1	10.2	22.6	60	-37.4	-	-
8	6.80775	5.23	Ca	0	.1	10.2	15.53	-	-	50	-34.47
9	14.79525	9.24	Qp	0	.2	10.2	19.64	60	-40.36	-	-
10	14.81325	2.63	Ca	0	.2	10.2	13.03	-	-	50	-36.97
11	24.35325	10	Qp	.1	.2	10.5	20.8	60	-39.2	-	-
12	24.35325	9.01	Ca	.1	.2	10.5	19.81	-	-	50	-30.19

Qp - Quasi-Peak detector

Ca - CISPR average detection

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LINE 2 RESULTS



WORST EMISSIONS

Range	e 2: Line-L2	2 .15 - 30	MHz								
Marker	Frequency	Meter	Det	LISN L2	LC	Limiter	Corrected	CFR 47	QP	CFR 47	Av(CISPR
	(MHz)	Reading			Cables	(dB)	Reading	Part 15	Margin	Part 15)Margin
		(dBuV)			2&3		dBuV	Class B	(dB)	Class B	(dB)
								QP		Avg	
13	.19275	45.3	Qp	0	0	10.1	55.4	63.92	-8.52	-	-
14	.1995	27.96	Ca	0	0	10.1	38.06	-	-	53.63	-15.57
15	.91275	15.02	Qp	0	0	10.1	25.12	56	-30.88	-	-
16	.90375	4.17	Ca	0	0	10.1	14.27	-	-	46	-31.73
17	3.62175	28.25	Qp	0	.1	10.1	38.45	56	-17.55	-	-
18	3.6195	17.02	Ca	0	.1	10.1	27.22	-	-	46	-18.78
19	7.18125	17.98	Qp	0	.1	10.2	28.28	60	-31.72	-	-
20	7.18125	10.13	Ca	0	.1	10.2	20.43	-	-	50	-29.57
21	14.35088	11.2	Qp	.1	.2	10.2	21.7	60	-38.3	-	-
22	14.3475	4.78	Ca	.1	.2	10.2	15.28	-	-	50	-34.72
23	23.1315	11.9	Qp	.1	.2	10.4	22.6	60	-37.4	-	-
24	23.1315	10.54	Ca	.1	.2	10.4	21.24	-	-	50	-28.76

Qp - Quasi-Peak detector

Ca - CISPR average detection

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11. DYNAMIC FREQUENCY SELECTION

11.1. OVERVIEW

11.1.1. LIMITS

FCC

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

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

Requirement	Operational Mode		
	Master	Client (without radar detection)	Client (with radar detection)
Non-Occupancy Period	Yes	Not required	Yes
DFS Detection Threshold	Yes	Not required	Yes
Channel Availability Check Time	Yes	Not required	Not required
U-NII Detection Bandwidth	Yes	Not required	Yes

Table 2: Applicability of DFS requirements during normal operation

Requirement	Operational Mode				
	Master	Client (without DFS)	Client (with DFS)		
DFS Detection Threshold	Yes	Not required	Yes		
Channel Closing Transmission Time	Yes	Yes	Yes		
Channel Move Time	Yes	Yes	Yes		
U-NII Detection Bandwidth	Yes	Not required	Yes		

Additional requirements for devices	Master Device or Client with	Client				
with multiple bandwidth modes	Radar DFS	(without DFS)				
U-NII Detection Bandwidth and	All BW modes must be tested	Not required				
Statistical Performance Check						
Channel Move Time and Channel	Test using widest BW mode	Test using the widest				
Closing Transmission Time	available	BW mode available				
		for the link				
All other tests	Any single BW mode	Not required				
Note: Frequencies selected for statistica	al performance check (Section 7.8.4)	should include several				
frequencies within the radar detection bandwidth and frequencies near the edge of the radar						
detection bandwidth. For 802.11 devices it is suggested to select frequencies in all 20 MHz channel						
blocks and a null frequency between the	bonded 20 MHz channel blocks.					

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

Maximum Transmit Power	Value				
	(see notes)				
E.I.R.P. ≥ 200 milliwatt	-64 dBm				
E.I.R.P. < 200 milliwatt and	-62 dBm				
power spectral density < 10 dBm/MHz					
E.I.R.P. < 200 milliwatt that do not meet power spectral density	-64 dBm				
requirement					
Note 1: This is the level at the input of the receiver assuming a 0 d	Bi receive antenna				
Note 2: Throughout these test procedures an additional 1 dB has b	een added to the amplitude of the				
test transmission waveforms to account for variations in measureme	ent equipment. This will ensure				
that the test signal is at or above the detection threshold level to trigger a DFS response.					
Note 3: E.I.R.P. is based on the highest antenna gain. For MIMO devices refer to KDB publication					
662911 D01.					

Table 4: DFS Response requirement values

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

Note 1: *Channel Move Time* and the *Channel Closing Transmission Time* should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst. **Note 2:** The *Channel Closing Transmission Time* is comprised of 200 milliseconds starting at the beginning of the *Channel Move Time* plus any additional intermittent control signals required to facilitate a *Channel* move (an aggregate of 60 milliseconds) during the remainder of the 10-second period. The aggregate duration of control signals will not count quiet periods in between transmissions.

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

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Table 5 – Short Pulse Radar Test Waveforms Pulse PRI Pulses Radar Minimum Minimum Width Trials Type (usec) Percentage (usec) of Successful Detection 0 1 1428 18 See Note 1 See Note 1 60% 30 1 1 Test A: 15 unique PRI values randomly selected from the list Roundup: of 23 PRI values in $\{(1/360) \times (19 \times 10^{6} \text{ PRI}_{\text{usec}})\}$ table 5a Test B: 15 unique PRI values randomly selected within the range of 518-3066 usec. With a minimum increment of 1 usec, excluding PRI values selected in Test A 150-230 2 1-5 23-29 60% 30 6-10 200-500 3 16-18 60% 30 11-20 200-500 12-16 4 60% 30 Aggregate (Radar Types 1-4) 80% 120 Note 1: Short Pulse Radar Type 0 should be used for the Detection Bandwidth test, Channel Move Time, and Channel Closing Time tests.

Table 6 – Long Pulse Radar Test Signal

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

Table 7 – Frequency Hopping Radar Test Signal

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

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11.1.2. TEST AND MEASUREMENT SYSTEM

RADIATED METHOD SYSTEM BLOCK DIAGRAM



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SYSTEM OVERVIEW

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

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

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

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

SYSTEM CALIBRATION

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

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

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

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ADJUSTMENT OF DISPLAYED TRAFFIC LEVEL

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

TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST							
Description	Manufacturer	Model	Asset Number	Cal Due			
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight	N9030A	US51350187	06/13/17			
Signal Generator, MXG X-Series RF Vector	Agilent	N5172B	MY51350337	03/11/17			

11.1.3. TEST AND MEASUREMENT SOFTWARE

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

TEST SOFTWARE LIST					
Name Version Test / Function					
Aggregate Time-PXA	3.0.0.9	Channel Loading and Aggregate Closing Time			
PXA Read	3.0	Signal Generator Screen Capture			
SGXProject.exe	1.7	Radar Waveform Generation and Download			

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11.1.4. SETUP OF EUT (CLIENT MODE)

RADIATED METHOD EUT TEST SETUP



SUPPORT EQUIPMENT

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

PERIPHERAL SUPPORT EQUIPMENT LIST						
Description	Manufacturer	Model	Serial Number	FCC ID		
3x3 MIMO Base Station (Master Device)	Apple	A1521	C86L3BA8FJ1R	BCGA1521		
Notebook PC (Controller/Server)	Apple	A1181	4H629022WLV	DoC		
AC Adapter (Controller/Server PC)	Delta Electronics	A1344	MV05104CNAL1A	DoC		

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11.1.5. SETUP OF EUT (CLIENT-TO-CLIENT COMMUNICATIONS MODE)

RADIATED METHOD EUT TEST SETUP



SUPPORT EQUIPMENT

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

PERIPHERAL SUPPORT EQUIPMENT LIST						
Description	Manufacturer	Model	Serial Number	FCC ID		
3x3 MIMO Base Station (Master Device)	Apple	A1521	C86L3BA8FJ1R	BCGA1521		
Notebook PC (Controller/Server)	Apple	A1181	4H629022WLV	DoC		
AC Adapter (Controller/Server PC)	Delta Electronics	A1344	MV05104CNAL1A	DoC		
Apple TV (Peer Slave Device)	Apple	A1625	C07PR001GPWK	BCGA1625		
Video Display	Polaroid	TLX-01511C	02006	DoC		

11.1.6. DESCRIPTION OF EUT

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

The EUT is a Slave Device without Radar Detection.

The highest power level within these bands is 22.52 dBm EIRP in the 5250-5350 MHz band and 23.03 dBm EIRP in the 5470-5725 MHz band.

The only antenna assembly utilized with the EUT has a gain of Antenna A, 2.24 dBi & Antenna B, 2.77 dBi in the 5250-5350 MHz band and Antenna A, 3.39 dBi & Antenna B, 3.17 dBi in the 5470-5725 MHz band.

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

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

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

In standard client mode WLAN traffic that meets or exceeds the minimum required loading was generated by streaming the compressed version of the video test file "6 ½ Magic Hours" from the Master to the Slave

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

TPC is not required since the maximum EIRP is less than 500 mW (27 dBm).

The EUT utilizes the 802.11ac architecture. Three nominal channel bandwidths are implemented: 20 MHz, 40 MHz and 80 MHz.

The software installed in the EUT is Version 10.3 (14E220).

The software installed in the access point is 7.7.2d0 dev.

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UNIFORM CHANNEL SPREADING

This function is not applicable Slave Devices.

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

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

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

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

The software installed in the access point is 7.7.2d0 dev.

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11.2. CLIENT MODE RESULTS FOR 20 MHz BANDWIDTH

11.2.1. TEST CHANNEL

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

11.2.2. RADAR WAVEFORM AND TRAFFIC

RADAR WAVEFORM



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TRAFFIC



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CHANNEL LOADING



The level of traffic loading on the channel by the EUT is 31.18%

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11.2.3. OVERLAPPING CHANNEL TESTS

RESULTS

These tests are not applicable.

11.2.4. MOVE AND CLOSING TIME

REPORTING NOTES

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

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

The aggregate channel closing transmission time is calculated as follows:

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

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

<u>RESULTS</u>

Channel Move Time	Limit
(sec)	(sec)
0.0948	10

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

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MOVE TIME

NL NP 303	2 DC	SENSE	Avg	ALIGNAUTO Type: Log-Pwr	04:15:25 PM Jan 09, 2017 TRACE 1 2 3 4 5 6	Frequency
	PNO: Fast IFGain:Hig	→→→ Trig: Free R h #Atten: 0 dB	un i		DET P P P P F	
Ref Offset -2 dB/div Ref -45.00	0.9 dB dBm			Δ	Mkr1 94.80 ms -14.52 dB	Auto Tun
9 5.0						Center Fre
1Δ2					-64.00 dBm	5.500000000 GH
5.0						Ctort Ero
	e en en esta destructura de la constante en esta de la constante en esta de la constante en esta de la constant				feren er en en ter en beseldt en liker en er	5.500000000 GH
15						
25						5 500000000 GH
ontor E 50000000	<u></u>				Enon 0 Hz	
es BW 3.0 MHz	σπ2 #V	BW 3.0 MHz		Sweep 1	6.00 s (40001 pts)	CF Ste 3.000000 MH
R MODE TRC SGL	× 94.80 ms	γ (Δ) -14.52 dE	FUNCTION 3	FUNCTION WIDTH	FUNCTION VALUE	Auto Ma
2 F 1 t	1.616 s	-64.28 dBm	1			Freg Offse
5						0+
7						
9 n						

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CHANNEL CLOSING TIME

RL RF 50 Ω	DC	SENSE:INT	Avg	ALIGN AUTO Type: Log-Pwr	04:19:27 PM Jan 09, 2017 TRACE 1 2 3 4 5 6	Frequency
Ref Offset -20 0 dB/div Ref -45.00	PN0: Fast ↔ IFGain:High 0.9 dB dBm	#Atten: 0 dB		۵	Mkr1 200.0 ms -34.93 dB	Auto Tune
5.0						Center Free 5.500000000 GH:
б.0 <mark>- X2</mark> (5.0					-64.00 dBm TRIG LVL	Start Free 5.500000000 GH
5.0		Δ2 has made for the	a de altra li daj	ution become the	Newsmith a second state	Stop Free 5.50000000 GH
115				inte Miss III de la content a visat en	real for for for for for the former of the f	CF Step 3.000000 MH <u>Auto</u> Mar
25						Freq Offse 0 H
enter 5.500000000 G	GHz (10)			0	Span 0 Hz	

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AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

No transmissions are observed during the aggregate monitoring period.



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11.3. CLIENT MODE RESULTS FOR 40 MHz BANDWIDTH

11.3.1. TEST CHANNEL

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

11.3.2. RADAR WAVEFORM AND TRAFFIC

RADAR WAVEFORM



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TRAFFIC



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CHANNEL LOADING



The level of traffic loading on the channel by the EUT is 30.584%

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11.3.3. OVERLAPPING CHANNEL TESTS

RESULTS

These tests are not applicable.

11.3.4. MOVE AND CLOSING TIME

REPORTING NOTES

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

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

The aggregate channel closing transmission time is calculated as follows:

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

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

<u>RESULTS</u>

Channel Move Time	Limit
(sec)	(sec)
0.0024	10

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

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MOVE TIME

RL	RF 50 Ω DC		SENS	SE:INT Avg	ALIGNAUTO Type: Log-Pwr	04:34:29 PM Jan 09, 2017 TRACE 1 2 3 4 5 6	Frequency
		PNO: Fast ← IFGain:High	Trig: Free I #Atten: 0 d	Run B		DET P P P P P	
R dB/div R	tef Offset -20.9 dE tef -45.00 dBn	3			Δ	Mkr1 2.400 ms -14.06 dB	Auto Tun
5.0							Center Fre
5.0	×1∆2					-64.00 dBm	5.510000000 GH
	P						
5.0							Start Fre
05							5.510000000 GH
15							Stop Fre
35							5.510000000 GH
enter 5.510	0000000 GHz					Span 0 Hz	
es BW 3.0	MHz	#VB	W 3.0 MHz		Sweep 1	6.00 s (40001 pts)	CF Ste 3.000000 MH
R MODE TRC 9	<u>ici</u> × t (Δ)	2.400 ms (/	v 14.06 c	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Ma
2 F 1 3	t	1.609 s	-64.15 dB	m			Fred Offs
1							0+
7							
9							
0							
2					CTATUS		

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CHANNEL CLOSING TIME

RL RF 50 9	2 DC DNO: East	SENSE:IN	ALIGN	AUTO 04:43:26 PM -Pwr TRACE TYPE	1 Jan 09, 2017 1 2 3 4 5 6 W	requency
Ref Offset -2 0 dB/div Ref -45.00	IFGain:Hig 20.9 dB 1 dBm	h #Atten:0dB		₀ 133∆Mkr1 <u>م</u>	0.0 ms 3.82 dB	Auto Tune
55.0					5.5	Center Free 10000000 GH:
75.0 2					-64.00 dBm TRIG LVL 5.5	Start Free 10000000 GH:
5.0			Landard and provide a still state of the providence of the state of th	te tel a la gradi co da const	5.5	Stop Fred 10000000 GH:
105	Martineoffering foreithe horitory foreith		n te de la constant d	da kolo in engen pertopolarian	Auto	CF Step 3.000000 MH: Mar
125						Freq Offse 0 H
center 5.510000000	GHz			SI	pan 0 Hz	

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AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

No transmissions are observed during the aggregate monitoring period.



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11.4. CLIENT MODE RESULTS FOR 80 MHz BANDWIDTH

11.4.1. TEST CHANNEL

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

11.4.2. RADAR WAVEFORM AND TRAFFIC

RADAR WAVEFORM



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TRAFFIC



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CHANNEL LOADING



The level of traffic loading on the channel by the EUT is 29.392%

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11.4.3. OVERLAPPING CHANNEL TESTS

RESULTS

These tests are not applicable.

11.4.4. MOVE AND CLOSING TIME

REPORTING NOTES

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

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

The aggregate channel closing transmission time is calculated as follows:

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

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

<u>RESULTS</u>

Channel Move Time	Limit
(sec)	(sec)
0.000	10

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

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MOVE TIME

RL	RF 50Ω 0	DC	SENS	E:INT	ALIGN AUTO	04:54:46 PM Jan 09, 2017	E
		PNO: Fast IFGain:High	Trig: Free F #Atten: 0 dE	Avç Run B	g Type: Log-Pwr	TYPE WWWWWWWW DET P P P P P	Frequency
l dB/div	Ref Offset -20.9 Ref -45.00 dE	dB				∆Mkr1 0.000 s 0.00 dB	Auto Tun
,g	142						Center Fre
5.0	2					-64.00 dBm	5.530000000 GH
5.0 5.0					ing dataset and a state of the		Start Fre
05							5.530000000 GH
15							Stop Fre
35							5.530000000 GH
enter 5.: es BW 3	530000000 GH .0 MHz	z #VI	BW 3.0 MHz		Sweep	Span 0 Hz 16.00 s (40001 pts)	CF Ste
R MODE TR	re sel t (A)	× 0.000 s	N 0.00 (A	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	Auto Ma
2 F 1	t (Δ)	1.653 s	-64.34 dBn	n			Erog Offor
1 5							0 F
7							
э							

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CHANNEL CLOSING TIME

RL RF 50 Ω	DC	SENSE:IN	Avg	ALIGN AUTO Type: Log-Pwr	05:01:08 PM Jan 09, 2017 TRACE 1 2 3 4 5 6	Frequency
Ref Offset -20 dB/div Ref -45.00 (PNO: Fast +++ IFGain:High I.9 dB dBm	#Atten: 0 dB		Δ	Mkr1 200.0 ms -33.18 dB	Auto Tune
5.0						Center Free 5.530000000 GH:
б.0 <mark>2</mark> (5.0					-64.00 dBm TRIG LVL	Start Free 5.53000000 GH:
5.0	land op little lands by 12	12		rreit i theme, floor de boureto	the state of the s	Stop Free 5.530000000 GH
105	يون دون داري واردي وي مريو روان وي اردي وي اردي وي مواد وون داري وي اردي وي	March into a feaseta di a più difici fano		te e presidente de la constance		CF Step 3.000000 MH <u>Auto</u> Mar
125						Freq Offse 0 H
enter 5.530000000 G	Hz #)/BM	2.0.004-		Swoon 60	Span 0 Hz	

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AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

No transmissions are observed during the aggregate monitoring period.



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11.4.5. 10-MINUTE CLIENT Tx MONITORING PERIOD

RESULTS

No EUT transmissions were observed on the test channel during the 10-minute observation time.



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11.5. CLIENT-TO-CLIENT COMMUNICATIONS MODE RESULTS FOR 20 MHz BANDWIDTH

11.5.1. TEST CHANNEL

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

11.5.2. RADAR WAVEFORM AND TRAFFIC

RADAR WAVEFORM



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TRAFFIC



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CHANNEL LOADING



The level of traffic loading on the channel by the EUT is 45.3%.

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11.5.3. OVERLAPPING CHANNEL TESTS

RESULTS

These tests are not applicable.

11.5.4. MOVE AND CLOSING TIME

REPORTING NOTES

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

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

The aggregate channel closing transmission time is calculated as follows:

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

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

<u>RESULTS</u>

Channel Move Time	Limit
(sec)	(sec)
0.182	10

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

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MOVE TIME

	00 1 00		SENSE:IP	NT	ALIGN AUTO	05:27:32 PM Jan 09, 2	Frequency
		PNO: Fast ↔ IFGain:High	Trig: Free Rur #Atten: 0 dB	n Avg	Type. Log-Fwi	TYPE WWWWW DET P P P P	PP
Re dB/div R e	f Offset -20.9 dB f -45.00 dBm				Δ	Mkr1 182.4 r -13.67 d	ns Auto Tun dB
g 							Center Fre
i.0	<u>1Δ2</u>					-64.00	^{dBm} 5.500000000 G⊦
20 <mark>representation</mark> 20	7						
50 50			La contra La constatione				Start Fre
							5.50000000 GH
15							
25							5 50000000 GH
35							
enter 5.500 es BW 3.0 N	000000 GHz 1Hz	#VBW	/ 3.0 MHz		Sweep 1	Span 0 6.00 s (40001 p	Hz ts) CF Ste
R MODE TRC SC	L X		Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	3.000000 MF
Δ2 1 t 2 F 1 t	(Δ)	182.4 ms (Δ) 1.648 s	-13.67 dB -64.44 dBm				
3							Freq Offs
5							0 H
7							

CHANNEL CLOSING TIME



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AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

No transmissions are observed during the aggregate monitoring period.



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11.6. CLIENT-TO-CLIENT COMMUNICATIONS MODE RESULTS FOR 40 MHz BANDWIDTH

11.6.1. TEST CHANNEL

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

11.6.2. RADAR WAVEFORM AND TRAFFIC

RADAR WAVEFORM



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TRAFFIC



CHANNEL LOADING



The level of traffic loading on the channel by the EUT is 40.76%

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11.6.3. OVERLAPPING CHANNEL TESTS

RESULTS

These tests are not applicable.

11.6.4. MOVE AND CLOSING TIME

REPORTING NOTES

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

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

The aggregate channel closing transmission time is calculated as follows:

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

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

<u>RESULTS</u>

Channel Move Time	Limit
(sec)	(sec)
0.1608	10

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

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MOVE TIME

RL RL	RF 50 S	2 DC		SENSE:INT		ALIGN AUTO	05:48:27 PM	Jan 09, 2017	-
		PNO: Fas IFGain:Hig	t Trig h #Att	: Free Run en: 0 dB	Avg 1	Гуре: Log-Pwr	TRACE TYPE DET	123456 WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW	Frequency
) dB/div	Ref Offset -2 Ref -45.00	20.9 dB 0 dBm				Δ	Mkr1 16 -14	0.8 ms .59 dB	Auto Tun
'g 5.0									Center Fre
5.0								-64.00 dBm	5.510000000 GH
5.0						trial transmittening			Start Fre
05									5.51000000 GH
25									Stop Fre
35									5.510000000 GH
enter 5 es BW	.510000000 3.0 MHz	GHz #\	/BW 3.0 I	ИНz		Sweep 1	Sp 6.00 s (40	oan 0 Hz 001 pts)	CF Ste
r Mode 1 Δ2	TRC SCL 1 t (Δ)	× 160.8 ms	(Δ) -1	4.59 dB	INCTION	FUNCTION WIDTH	FUNCTION	VALUE	<u>Auto</u> Ma
2 F 3 4 5	1 t	1.614 s	-64.	04 dBm					Freq Offse
6 7									
8 9									
1									

CHANNEL CLOSING TIME



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AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

No transmissions are observed during the aggregate monitoring period.



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11.7. CLIENT-TO-CLIENT COMMUNICATIONS MODE RESULTS FOR 80 MHz BANDWIDTH

11.7.1. TEST CHANNEL

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

11.7.2. RADAR WAVEFORM AND TRAFFIC

RADAR WAVEFORM



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TRAFFIC



CHANNEL LOADING



The level of traffic loading on the channel by the EUT is 39.424%

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11.7.3. OVERLAPPING CHANNEL TESTS

RESULTS

These tests are not applicable.

11.7.4. MOVE AND CLOSING TIME

REPORTING NOTES

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

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

The aggregate channel closing transmission time is calculated as follows:

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

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

<u>RESULTS</u>

Channel Move Time	Limit
(sec)	(sec)
0.1076	10

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

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MOVE TIME

RL RL	ctrum Analyzer - 44 RF 50 ຄ	352, DFS 1		SENSE:	INT	ALIGN AUTO	06:17:16 PM 3	an 09, 2017 🛛	_
		PNO: Fa IFGain:Hi	st ↔ → gh i	Trig: Free Ru #Atten: 0 dB	Avg	Type: Log-Pwr	TRACE 1 TYPE W DET P	23456 PPPPP	Frequency
) dB/div	Ref Offset -2 Ref -45.00	0.9 dB dBm				Δ	Mkr1 107 -13.	.6 ms 12 dB	Auto Tun
29 5.0									Center Fre
5.0	162							-64.00 dBm	5.530000000 GH
5.0						distribution of the second			Start Fre
05									5.530000000 GH
15									Stop Ere
35									5.530000000 GH
enter : es BW	5.530000000 (3.0 MHz	GHz #	VBW 3	.0 MHz		Sweep 1	Spa 6.00 s (400	un 0 Hz 01 pts)	CF Ste
GR MODE	TRC SCL 1 t (Δ)	× 107.6 ms	s (Δ)	Y -13.12 dB	FUNCTION	FUNCTION WIDTH	FUNCTION V	ALUE	Auto Ma
2 F 3 4	1 t	1.668 :	5	-64.28 dBm					Freq Offse
6 7									UF
8 9									
0									

CHANNEL CLOSING TIME



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AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

Only intermittent transmissions are observed during the aggregate monitoring period.



10-MINUTE CLIENT TX MONITORING PERIOD

RESULTS

No EUT transmissions were observed on the test channel during the 10-minute observation time.

RL RF 50Ω	PNO: Fast ++	SENSE:INT	ALIGN AUTO Avg Type: Log-Pwr	06:39:50 PM Jan 09, 2017 TRACE 1 2 3 4 5 6 TYPE WWWWWWWWW	Frequency
Ref Offset -20.9 0 dB/div Ref -45.00 dB	IFGain:High dB 3m	#Atten: 0 dB		ΔMkr1 600.0 s -11.23 dB	Auto Tune
5.0				-64.00.48m	Center Free 5.530000000 GH
5.0					Start Free 5.530000000 GH
5.0 X2 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0	transport in Statistics and second lists			1Δ2	Stop Fre 5.530000000 GH
15					CF Step 3.000000 MH <u>Auto</u> Ma
25					Freq Offse 0 H
enter 5.530000000 GH	z #\/B\//	3.0 MHz	Sween	Span 0 Hz 720 0 s (40001 pts)	
G	<i>"••</i> В ••		STATU	s	11

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