FCC DFS Test Report

Equipment	**: WLAN + BT Combo Module**
Brand Name	**: LITE-ON**
Model No.	**: WCBN4506R**
FCC ID	**: PPQ-WCBN4506R**
Standard	**: 47 CFR FCC Part 15.407**
Frequency Range	**: 5250 MHz – 5350 MHz 5470 MHz – 5725 MHz**
Applicant	**: Lite-On Technology Corp. Bldg. C, 90, Chien 1 Road, Chung Ho, New Taipei City 23585, Taiwan, R.O.C**
Manufacturer	**: LITE-ON TECHNOLOGY (Changzhou) CO., LTD A9 Building, No.88 Yanghu Road, Wujin Hi-Tech Industrial Development Zone, Changzhou City, Jiangsu Province 213100 China**
Operate Mode	**: Client without radar detection**

The product sample received on Sep. 08, 2015 and completely tested on Oct. 13, 2015. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures given in FCC KDB 905462 D02 UNII DFS Compliance Procedures New Rules v01r02 and shown compliance with the applicable technical standards.
The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Sam Chen
SPORTON INTERNATIONAL INC.

Testing Laboratory
1190

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Summary of Test Result

Conformance Test Specifications				
Report Clause	**Ref. Std. Clause**	**Description**	**Limit**	**Result**
3.3	FCC KDB 905462 7.8.3	DFS: In-Service Monitoring for Channel Move Time (CMT)	CMT ≤ 10sec	Complied
3.3	FCC KDB 905462 7.8.3	DFS: In-Service Monitoring for Channel Closing Transmission Time (CCTT)	CCTT ≤ 60 ms starting at CMT 200ms	Complied
3.3	FCC KDB 905462 7.8.3	DFS: In-Service Monitoring for Non-Occupancy Period (NOP)	NOP ≥ 30 min	Complied

Note: Since the product is client without radar detection function, only Channel Move Time, Channel Closing Transmission Time and Non-Occupancy Period are required to perform.

Revision History

Report No.	Version	Description	Issued Date
FZ590501	Rev. 01	Initial issue of report	Nov. 04, 2015

1 General Description

1.1 Information

1.1.1 RF General Information

Specification Items	Description	
Product Type	WLAN (2TX, 2RX)	
Radio Type	Intentional Transceiver	
Power Type	From host system	
Modulation	IEEE 802.11a: OFDM (BPSK / QPSK / 16QAM / 64QAM) IEEE 802.11n: see the below table	
Data Rate (Mbps)	IEEE 802.11a: OFDM (6/9/12/18/24/36/48/54) IEEE 802.11n: see the below table	
Channel Bandwidth	20/40 MHz operating channel bandwidth	
Operating Mode	☐ Master	
	☐ Client with radar detection	
	☒ Client without radar detection	
Communication Mode	☒ IP Based (Load Based)	☐ Frame Based
TPC Function	☐ With TPC	☒ Without TPC
Weather Band (5600~5650MHz)	☒ With 5600~5650MHz	☐ Without 5600~5650MHz
Max. Con. Power (DFS band)	For Mode 1: Band 2: IEEE 802.11a: 23.75 dBm IEEE 802.11n MCS0 (HT20): 23.66 dBm IEEE 802.11n MCS0 (HT40): 23.97 dBm Band 3: IEEE 802.11a: 23.69 dBm IEEE 802.11n MCS0 (HT20): 23.89 dBm IEEE 802.11n MCS0 (HT40): 23.74 dBm For Mode 2: Band 2: IEEE 802.11a: 23.61 dBm IEEE 802.11n MCS0 (HT20): 23.63 dBm IEEE 802.11n MCS0 (HT40): 23.71 dBm Band 3: IEEE 802.11a: 23.86 dBm IEEE 802.11n MCS0 (HT20): 23.90 dBm IEEE 802.11n MCS0 (HT40): 23.60 dBm	

Min. Con. Power (DFS band)	For Mode 1: Band 2: IEEE 802.11a: 17.75 dBm IEEE 802.11n MCS0 (HT20): 17.66 dBm IEEE 802.11n MCS0 (HT40): 17.97 dBm Band 3: IEEE 802.11a: 17.69 dBm IEEE 802.11n MCS0 (HT20): 17.89 dBm IEEE 802.11n MCS0 (HT40): 17.74 dBm For Mode 2: Band 2: IEEE 802.11a: 17.61 dBm IEEE 802.11n MCS0 (HT20): 17.63 dBm IEEE 802.11n MCS0 (HT40): 17.71 dBm Band 3: IEEE 802.11a: 17.86 dBm IEEE 802.11n MCS0 (HT20): 17.90 dBm IEEE 802.11n MCS0 (HT40): 17.60 dBm
Max. EIRP Power (DFS band)	For Mode 1: Band 2: IEEE 802.11a: 26.62 dBm IEEE 802.11n MCS0 (HT20): 26.53 dBm IEEE 802.11n MCS0 (HT40): 26.84 dBm Band 3: IEEE 802.11a: 26.00 dBm IEEE 802.11n MCS0 (HT20): 26.20 dBm IEEE 802.11n MCS0 (HT40): 26.05 dBm For Mode 2: Band 2: IEEE 802.11a: 25.42 dBm IEEE 802.11n MCS0 (HT20): 25.44 dBm IEEE 802.11n MCS0 (HT40): 25.52 dBm Band 3: IEEE 802.11a: 26.00 dBm IEEE 802.11n MCS0 (HT20): 26.04 dBm IEEE 802.11n MCS0 (HT40): 25.74 dBm

Min. EIRP Power (DFS band)	For Mode 1: Band 2: IEEE 802.11a: 20.62 dBm IEEE 802.11n MCS0 (HT20): 20.53 dBm IEEE 802.11n MCS0 (HT40): 20.84 dBm Band 3: IEEE 802.11a: 20.00 dBm IEEE 802.11n MCS0 (HT20): 20.20 dBm IEEE 802.11n MCS0 (HT40): 20.05 dBm For Mode 2: Band 2: IEEE 802.11a: 19.42 dBm IEEE 802.11n MCS0 (HT20): 19.44 dBm IEEE 802.11n MCS0 (HT40): 19.52 dBm Band 3: IEEE 802.11a: 20.00 dBm IEEE 802.11n MCS0 (HT20): 20.04 dBm IEEE 802.11n MCS0 (HT40): 19.74 dBm
Power-on cycle	NA (No Channel Availability Check Function)
Software / Firmware Version	5.1.19.0
Note: TPC is not required since the maximum EIRP is less than 500mW (27dBm).	

Antenna & Band width

Antenna	**Two (TX)**	
Band width Mode	20 MHz	40 MHz
IEEE 802.11a	V	X
IEEE 802.11n	V	V

IEEE 11n Spec.

Protocol	**Number of Transmit Chains (NTX)**	**Data Rate / MCS**
802.11n (HT20)	2	MCS0-15
802.11n (HT40)	2	MCS0-15
Note 1: IEEE Std. 802.11n modulation consists of HT20 and HT40 (HT: High Throughput). Then EUT support HT20 and HT40. Note 2: Modulation modes consist of below configuration: 11a: IEEE 802.11a, HT20/HT40: IEEE 802.11n		

1.1.2 Antenna Information

Set	Ant.	Brand Holder	Model Name	Antenna Type	Connector	Remark
1	1	SONY corporation	WCBN4506R	PIFA Antenna	N/A	Only for EUT 2 WiFi use
	2	SONY corporation	WCBN4506R	PIFA Antenna	N/A	Only for EUT 2 WiFi use
2	3	SONY corporation	WCBN4506R	Dipole Antenna	I-PEX	For EUT 1 WiFi and BT use For EUT 2 BT use
	4	SONY corporation	WCBN4506R	Dipole Antenna	I-PEX	For EUT 1 WiFi and BT use For EUT 2 BT use
3	5	Waka manufacturing Co.,Ltd.	01S1072-00	Dipole Antenna	I-PEX	Only for EUT 1 WiFi use
	6	Waka manufacturing Co.,Ltd.	01S1072-00	Dipole Antenna	I-PEX	Only for EUT 1 WiFi use

Set	Ant.	Gain (dBi)						
		BT-2.4GHz	WiFi-2.4GHz	WiFi-5GHz Band 1	WiFi-5GHz Band 2	WiFi-5GHz Band 3	WiFi-5GHz Band 4	Cable Length [mm]
1	1	-	0.71	1.81	1.81	2.14	1.8	N/A
	2	-	0.13	0.72	1.78	2.12	1.67	N/A
2 Note1	3	1.61	1.61	2.13	2.13	2.31	2.68	100-910mm Note2
	4	1.61	1.61	2.13	2.13	2.31	2.68	100-910mm Note2
3 Note1	5	-	2.06	2.41	2.87	1.89	2.7	90mm
	6	-	2.06	2.41	2.87	1.89	2.7	90mm

Note:
1. Gain with cable loss
2. Table for Cable loss Information
I-PEX Plug: Normal Type

Cable No.	Model Cable Color : Black	Cable No.	Model Cable Color : Gray	Cable No.	Model Cable Color : White	Brand	Cable Length [mm]	Phi [mm]	Connector Type	Cable Loss					
										2.4 GHz	2.45 GHz	2.5 GHz	5.15 GHz	5.5 GHz	5.85 GHz
1	822EKQ1000000001H1	83	822EKR1000000001H1	165	822EKP1000000001H1	I-PEX	100	1.13	MHF	0.51	0.51	0.52	0.79	0.80	0.82
2	822EKQ1100000001H1	84	822EKR1100000001H1	166	822EKP1100000001H1	I-PEX	110	1.13	MHF	0.54	0.54	0.55	0.84	0.85	0.87
3	822EKQ1200000001H1	85	822EKR1200000001H1	167	822EKP1200000001H1	I-PEX	120	1.13	MHF	0.57	0.57	0.58	0.88	0.90	0.92
4	822EKQ1300000001H1	86	822EKR1300000001H1	168	822EKP1300000001H1	I-PEX	130	1.13	MHF	0.60	0.60	0.62	0.93	0.94	0.97
5	822EKQ1400000001H1	87	822EKR1400000001H1	169	822EKP1400000001H1	I-PEX	140	1.13	MHF	0.63	0.64	0.65	0.98	0.99	1.02
6	822EKQ1500000001H1	88	822EKR1500000001H1	170	822EKP1500000001H1	I-PEX	150	1.13	MHF	0.67	0.67	0.68	1.02	1.04	1.07
7	822EKQ1600000001H1	89	822EKR1600000001H1	171	822EKP1600000001H1	I-PEX	160	1.13	MHF	0.70	0.70	0.71	1.07	1.09	1.12
8	822EKQ1700000001H1	90	822EKR1700000001H1	172	822EKP1700000001H1	I-PEX	170	1.13	MHF	0.73	0.73	0.74	1.11	1.14	1.17
9	822EKQ1800000001H1	91	822EKR1800000001H1	173	822EKP1800000001H1	I-PEX	180	1.13	MHF	0.76	0.76	0.77	1.16	1.18	1.22
10	822EKQ1900000001H1	92	822EKR1900000001H1	174	822EKP1900000001H1	I-PEX	190	1.13	MHF	0.79	0.79	0.81	1.21	1.23	1.27
11	822EKQ2000000001H1	93	822EKR2000000001H1	175	822EKP2000000001H1	I-PEX	200	1.13	MHF	0.82	0.83	0.84	1.25	1.28	1.32
12	822EKQ2100000001H1	94	822EKR2100000001H1	176	822EKP2100000001H1	I-PEX	210	1.13	MHF	0.85	0.86	0.87	1.30	1.33	1.37
13	822EKQ2200000001H1	95	822EKR2200000001H1	177	822EKP2200000001H1	I-PEX	220	1.13	MHF	0.88	0.89	0.90	1.35	1.37	1.42
14	822EKQ2300000001H1	96	822EKR2300000001H1	178	822EKP2300000001H1	I-PEX	230	1.13	MHF	0.91	0.92	0.93	1.39	1.42	1.47
15	822EKQ2400000001H1	97	822EKR2400000001H1	179	822EKP2400000001H1	I-PEX	240	1.13	MHF	0.95	0.95	0.96	1.44	1.47	1.52
16	822EKQ2500000001H1	98	822EKR2500000001H1	180	822EKP2500000001H1	I-PEX	250	1.13	MHF	0.98	0.98	1.00	1.48	1.52	1.57
17	822EKQ2600000001H1	99	822EKR2600000001H1	181	822EKP2600000001H1	I-PEX	260	1.13	MHF	1.01	1.02	1.03	1.53	1.57	1.62
18	822EKQ2700000001H1	100	822EKR2700000001H1	182	822EKP2700000001H1	I-PEX	270	1.13	MHF	1.04	1.05	1.06	1.58	1.61	1.67
19	822EKQ2800000001H1	101	822EKR2800000001H1	183	822EKP2800000001H1	I-PEX	280	1.13	MHF	1.07	1.08	1.09	1.62	1.66	1.72
20	822EKQ2900000001H1	102	822EKR2900000001H1	184	822EKP2900000001H1	I-PEX	290	1.13	MHF	1.10	1.11	1.12	1.67	1.71	1.77
21	822EKQ3000000001H1	103	822EKR3000000001H1	185	822EKP3000000001H1	I-PEX	300	1.13	MHF	1.13	1.14	1.15	1.72	1.76	1.82
22	822EKQ3100000001H1	104	822EKR3100000001H1	186	822EKP3100000001H1	I-PEX	310	1.13	MHF	1.16	1.17	1.19	1.76	1.81	1.87
23	822EKQ3200000001H1	105	822EKR3200000001H1	187	822EKP3200000001H1	I-PEX	320	1.13	MHF	1.19	1.21	1.22	1.81	1.85	1.92
24	822EKQ3300000001H1	106	822EKR3300000001H1	188	822EKP3300000001H1	I-PEX	330	1.13	MHF	1.23	1.24	1.25	1.85	1.90	1.97
25	822EKQ3400000001H1	107	822EKR3400000001H1	189	822EKP3400000001H1	I-PEX	340	1.13	MHF	1.26	1.27	1.28	1.90	1.95	2.02
26	822EKQ3500000001H1	108	822EKR3500000001H1	190	822EKP3500000001H1	I-PEX	350	1.13	MHF	1.29	1.30	1.31	1.95	2.00	2.07
27	822EKQ3600000001H1	109	822EKR3600000001H1	191	822EKP3600000001H1	I-PEX	360	1.13	MHF	1.32	1.33	1.34	1.99	2.05	2.12
28	822EKQ3700000001H1	110	822EKR3700000001H1	192	822EKP3700000001H1	I-PEX	370	1.13	MHF	1.35	1.36	1.38	2.04	2.09	2.17
29	822EKQ3800000001H1	111	822EKR3800000001H1	193	822EKP3800000001H1	I-PEX	380	1.13	MHF	1.38	1.39	1.41	2.09	2.14	2.22
30	822EKQ3900000001H1	112	822EKR3900000001H1	194	822EKP3900000001H1	I-PEX	390	1.13	MHF	1.41	1.43	1.44	2.13	2.19	2.27
31	822EKQ4000000001H1	113	822EKR4000000001H1	195	822EKP4000000001H1	I-PEX	400	1.13	MHF	1.44	1.46	1.47	2.18	2.24	2.32
32	822EKQ4100000001H1	114	822EKR4100000001H1	196	822EKP4100000001H1	I-PEX	410	1.13	MHF	1.47	1.49	1.50	2.23	2.28	2.37
33	822EKQ4200000001H1	115	822EKR4200000001H1	197	822EKP4200000001H1	I-PEX	420	1.13	MHF	1.51	1.52	1.53	2.27	2.33	2.42
34	822EKQ4300000001H1	116	822EKR4300000001H1	198	822EKP4300000001H1	I-PEX	430	1.13	MHF	1.54	1.55	1.57	2.32	2.38	2.47
35	822EKQ4400000001H1	117	822EKR4400000001H1	199	822EKP4400000001H1	I-PEX	440	1.13	MHF	1.57	1.58	1.60	2.36	2.43	2.52
36	822EKQ4500000001H1	118	822EKR4500000001H1	200	822EKP4500000001H1	I-PEX	450	1.13	MHF	1.60	1.62	1.63	2.41	2.48	2.57
37	822EKQ4600000001H1	119	822EKR4600000001H1	201	822EKP4600000001H1	I-PEX	460	1.13	MHF	1.63	1.65	1.66	2.46	2.52	2.62
38	822EKQ4700000001H1	120	822EKR4700000001H1	202	822EKP4700000001H1	I-PEX	470	1.13	MHF	1.66	1.68	1.69	2.50	2.57	2.67
39	822EKQ4800000001H1	121	822EKR4800000001H1	203	822EKP4800000001H1	I-PEX	480	1.13	MHF	1.69	1.71	1.72	2.55	2.62	2.72
40	822EKQ4900000001H1	122	822EKR4900000001H1	204	822EKP4900000001H1	I-PEX	490	1.13	MHF	1.72	1.74	1.76	2.60	2.67	2.77
41	822EKQ5000000001H1	123	822EKR5000000001H1	205	822EKP5000000001H1	I-PEX	500	1.13	MHF	1.75	1.77	1.79	2.64	2.72	2.82
42	822EKQ5100000001H1	124	822EKR5100000001H1	206	822EKP5100000001H1	I-PEX	510	1.13	MHF	1.79	1.81	1.82	2.69	2.76	2.87
43	822EKQ5200000001H1	125	822EKR5200000001H1	207	822EKP5200000001H1	I-PEX	520	1.13	MHF	1.82	1.84	1.85	2.73	2.81	2.92
44	822EKQ5300000001H1	126	822EKR5300000001H1	208	822EKP5300000001H1	I-PEX	530	1.13	MHF	1.85	1.87	1.88	2.78	2.86	2.97
45	822EKQ5400000001H1	127	822EKR5400000001H1	209	822EKP5400000001H1	I-PEX	540	1.13	MHF	1.88	1.90	1.91	2.83	2.91	3.02
46	822EKQ5500000001H1	128	822EKR5500000001H1	210	822EKP5500000001H1	I-PEX	550	1.13	MHF	1.91	1.93	1.95	2.87	2.96	3.07
47	822EKQ5600000001H1	129	822EKR5600000001H1	211	822EKP5600000001H1	I-PEX	560	1.13	MHF	1.94	1.96	1.98	2.92	3.00	3.12
48	822EKQ5700000001H1	130	822EKR5700000001H1	212	822EKP5700000001H1	I-PEX	570	1.13	MHF	1.97	2.00	2.01	2.97	3.05	3.17
49	822EKQ5800000001H1	131	822EKR5800000001H1	213	822EKP5800000001H1	I-PEX	580	1.13	MHF	2.00	2.03	2.04	3.01	3.10	3.22
50	822EKQ5900000001H1	132	822EKR5900000001H1	214	822EKP5900000001H1	I-PEX	590	1.13	MHF	2.03	2.06	2.07	3.06	3.15	3.27
51	822EKQ6000000001H1	133	822EKR6000000001H1	215	822EKP6000000001H1	I-PEX	600	1.13	MHF	2.07	2.09	2.11	3.11	3.20	3.32
52	822EKQ6100000001H1	134	822EKR6100000001H1	216	822EKP6100000001H1	I-PEX	610	1.13	MHF	2.10	2.12	2.14	3.15	3.24	3.36
53	822EKQ6200000001H1	135	822EKR6200000001H1	217	822EKP6200000001H1	I-PEX	620	1.13	MHF	2.13	2.15	2.17	3.20	3.29	3.41
54	822EKQ6300000001H1	136	822EKR6300000001H1	218	822EKP6300000001H1	I-PEX	630	1.13	MHF	2.16	2.18	2.20	3.24	3.34	3.46
55	822EKQ6400000001H1	137	822EKR6400000001H1	219	822EKP6400000001H1	I-PEX	640	1.13	MHF	2.19	2.22	2.23	3.29	3.39	3.51
56	822EKQ6500000001H1	138	822EKR6500000001H1	220	822EKP6500000001H1	I-PEX	650	1.13	MHF	2.22	2.25	2.26	3.34	3.43	3.56
57	822EKQ6600000001H1	139	822EKR6600000001H1	221	822EKP6600000001H1	I-PEX	660	1.13	MHF	2.25	2.28	2.30	3.38	3.48	3.61
58	822EKQ6700000001H1	140	822EKR6700000001H1	222	822EKP6700000001H1	I-PEX	670	1.13	MHF	2.28	2.31	2.33	3.43	3.53	3.66
59	822EKQ6800000001H1	141	822EKR6800000001H1	223	822EKP6800000001H1	I-PEX	680	1.13	MHF	2.31	2.34	2.36	3.48	3.58	3.71
60	822EKQ6900000001H1	142	822EKR6900000001H1	224	822EKP6900000001H1	I-PEX	690	1.13	MHF	2.34	2.37	2.39	3.52	3.63	3.76
61	822EKQ7000000001H1	143	822EKR7000000001H1	225	822EKP7000000001H1	I-PEX	700	1.13	MHF	2.38	2.41	2.42	3.57	3.67	3.81
62	822EKQ7100000001H1	144	822EKR7100000001H1	226	822EKP7100000001H1	I-PEX	710	1.13	MHF	2.41	2.44	2.45	3.61	3.72	3.86
63	822EKQ7200000001H1	145	822EKR7200000001H1	227	822EKP7200000001H1	I-PEX	720	1.13	MHF	2.44	2.47	2.49	3.66	3.77	3.91
64	822EKQ7300000001H1	146	822EKR7300000001H1	228	822EKP7300000001H1	I-PEX	730	1.13	MHF	2.47	2.50	2.52	3.71	3.82	3.96
65	822EKQ7400000001H1	147	822EKR7400000001H1	229	822EKP7400000001H1	I-PEX	740	1.13	MHF	2.50	2.53	2.55	3.75	3.87	4.01
66	822EKQ7500000001H1	148	822EKR7500000001H1	230	822EKP7500000001H1	I-PEX	750	1.13	MHF	2.53	2.56	2.58	3.80	3.91	4.06
67	822EKQ7600000001H1	149	822EKR7600000001H1	231	822EKP7600000001H1	I-PEX	760	1.13	MHF	2.56	2.60	2.61	3.85	3.96	4.11
68	822EKQ7700000001H1	150	822EKR7700000001H1	232	822EKP7700000001H1	I-PEX	770	1.13	MHF	2.59	2.63	2.64	3.89	4.01	4.16
69	822EKQ7800000001H1	151	822EKR7800000001H1	233	822EKP7800000001H1	I-PEX	780	1.13	MHF	2.62	2.66	2.68	3.94	4.06	4.21
70	822EKQ7900000001H1	152	822EKR7900000001H1	234	822EKP7900000001H1	I-PEX	790	1.13	MHF	2.66	2.69	2.71	3.98	4.11	4.26
71	822EKQ8000000001H1	153	822EKR8000000001H1	235	822EKP8000000001H1	I-PEX	800	1.13	MHF	2.69	2.72	2.74	4.03	4.15	4.31
72	822EKQ8100000001H1	154	822EKR8100000001H1	236	822EKP8100000001H1	I-PEX	810	1.13	MHF	2.72	2.75	2.77	4.08	4.20	4.36
73	822EKQ8200000001H1	155	822EKR8200000001H1	237	822EKP8200000001H1	I-PEX	820	1.13	MHF	2.75	2.79	2.80	4.12	4.25	4.41
74	822EKQ8300000001H1	156	822EKR8300000001H1	238	822EKP8300000001H1	I-PEX	830	1.13	MHF	2.78	2.82	2.83	4.17	4.30	4.46
75	822EKQ8400000001H1	157	822EKR8400000001H1	239	822EKP8400000001H1	I-PEX	840	1.13	MHF	2.81	2.85	2.87	4.22	4.34	4.51
76	822EKQ8500000001H1	158	822EKR8500000001H1	240	822EKP8500000001H1	I-PEX	850	1.13	MHF	2.84	2.88	2.90	4.26	4.39	4.56
77	822EKQ8600000001H1	159	822EKR8600000001H1	241	822EKP8600000001H1	I-PEX	860	1.13	MHF	2.87	2.91	2.93	4.31	4.44	4.61
78	822EKQ8700000001H1	160	822EKR8700000001H1	242	822EKP8700000001H1	I-PEX	870	1.13	MHF	2.90	2.94	2.96	4.36	4.49	4.66
79	822EKQ8800000001H1	161	822EKR8800000001H1	243	822EKP8800000001H1	I-PEX	880	1.13	MHF	2.94	2.97	2.99	4.40	4.54	4.71
80	822EKQ8900000001H1	162	822EKR8900000001H1	244	822EKP8900000001H1	I-PEX	890	1.13	MHF	2.97	3.01	3.02	4.45	4.58	4.76
81	822EKQ9000000001H1	163	822EKR9000000001H1	245	822EKP9000000001H1	I-PEX	900	1.13	MHF	3.00	3.04	3.06	4.49	4.63	4.81
82	822EKQ9100000001H1	164	822EKR9100000001H1	246	822EKP9100000001H1	I-PEX	910	1.13	MHF	3.03	3.07	3.09	4.54	4.68	4.86

I-PEX Plug : Smooth Insert Type

Cable No.	Model Cable Color : Black	Cable No.	Model Cable Color : Gray	Cable No.	Model Cable Color : White	Brand	Cable Length [mm]	Phi [mm]	Connector Type	Cable Loss					
										2.4 GHz	2.45 GHz	2.5 GHz	5.15 GHz	5.5 GHz	5.85 GHz
247	822EKQ1000000001H3	329	822EKR1000000001H3	411	822EKP1000000001H3	I-PEX	100	1.13	MHF	0.51	0.51	0.52	0.79	0.80	0.82
248	822EKQ1100000001H3	330	822EKR1100000001H3	412	822EKP1100000001H3	I-PEX	110	1.13	MHF	0.54	0.54	0.55	0.84	0.85	0.87
249	822EKQ1200000001H3	331	822EKR1200000001H3	413	822EKP1200000001H3	I-PEX	120	1.13	MHF	0.57	0.57	0.58	0.88	0.90	0.92
250	822EKQ1300000001H3	332	822EKR1300000001H3	414	822EKP1300000001H3	I-PEX	130	1.13	MHF	0.60	0.60	0.62	0.93	0.94	0.97
251	822EKQ1400000001H3	333	822EKR1400000001H3	415	822EKP1400000001H3	I-PEX	140	1.13	MHF	0.63	0.64	0.65	0.98	0.99	1.02
252	822EKQ1500000001H3	334	822EKR1500000001H3	416	822EKP1500000001H3	I-PEX	150	1.13	MHF	0.67	0.67	0.68	1.02	1.04	1.07
253	822EKQ1600000001H3	335	822EKR1600000001H3	417	822EKP1600000001H3	I-PEX	160	1.13	MHF	0.70	0.70	0.71	1.07	1.09	1.12
254	822EKQ1700000001H3	336	822EKR1700000001H3	418	822EKP1700000001H3	I-PEX	170	1.13	MHF	0.73	0.73	0.74	1.11	1.14	1.17
255	822EKQ1800000001H3	337	822EKR1800000001H3	419	822EKP1800000001H3	I-PEX	180	1.13	MHF	0.76	0.76	0.77	1.16	1.18	1.22
256	822EKQ1900000001H3	338	822EKR1900000001H3	420	822EKP1900000001H3	I-PEX	190	1.13	MHF	0.79	0.79	0.81	1.21	1.23	1.27
257	822EKQ2000000001H3	339	822EKR2000000001H3	421	822EKP2000000001H3	I-PEX	200	1.13	MHF	0.82	0.83	0.84	1.25	1.28	1.32
258	822EKQ2100000001H3	340	822EKR2100000001H3	422	822EKP2100000001H3	I-PEX	210	1.13	MHF	0.85	0.86	0.87	1.30	1.33	1.37
259	822EKQ2200000001H3	341	822EKR2200000001H3	423	822EKP2200000001H3	I-PEX	220	1.13	MHF	0.88	0.89	0.90	1.35	1.37	1.42
260	822EKQ2300000001H3	342	822EKR2300000001H3	424	822EKP2300000001H3	I-PEX	230	1.13	MHF	0.91	0.92	0.93	1.39	1.42	1.47
261	822EKQ2400000001H3	343	822EKR2400000001H3	425	822EKP2400000001H3	I-PEX	240	1.13	MHF	0.95	0.95	0.96	1.44	1.47	1.52
262	822EKQ2500000001H3	344	822EKR2500000001H3	426	822EKP2500000001H3	I-PEX	250	1.13	MHF	0.98	0.98	1.00	1.48	1.52	1.57
263	822EKQ2600000001H3	345	822EKR2600000001H3	427	822EKP2600000001H3	I-PEX	260	1.13	MHF	1.01	1.02	1.03	1.53	1.57	1.62
264	822EKQ2700000001H3	346	822EKR2700000001H3	428	822EKP2700000001H3	I-PEX	270	1.13	MHF	1.04	1.05	1.06	1.58	1.61	1.67
265	822EKQ2800000001H3	347	822EKR2800000001H3	429	822EKP2800000001H3	I-PEX	280	1.13	MHF	1.07	1.08	1.09	1.62	1.66	1.72
266	822EKQ2900000001H3	348	822EKR2900000001H3	430	822EKP2900000001H3	I-PEX	290	1.13	MHF	1.10	1.11	1.12	1.67	1.71	1.77
267	822EKQ3000000001H3	349	822EKR3000000001H3	431	822EKP3000000001H3	I-PEX	300	1.13	MHF	1.13	1.14	1.15	1.72	1.76	1.82
268	822EKQ3100000001H3	350	822EKR3100000001H3	432	822EKP3100000001H3	I-PEX	310	1.13	MHF	1.16	1.17	1.19	1.76	1.81	1.87
269	822EKQ3200000001H3	351	822EKR3200000001H3	433	822EKP3200000001H3	I-PEX	320	1.13	MHF	1.19	1.21	1.22	1.81	1.85	1.92
270	822EKQ3300000001H3	352	822EKR3300000001H3	434	822EKP3300000001H3	I-PEX	330	1.13	MHF	1.23	1.24	1.25	1.85	1.90	1.97
271	822EKQ3400000001H3	353	822EKR3400000001H3	435	822EKP3400000001H3	I-PEX	340	1.13	MHF	1.26	1.27	1.28	1.90	1.95	2.02
272	822EKQ3500000001H3	354	822EKR3500000001H3	436	822EKP3500000001H3	I-PEX	350	1.13	MHF	1.29	1.30	1.31	1.95	2.00	2.07
273	822EKQ3600000001H3	355	822EKR3600000001H3	437	822EKP3600000001H3	I-PEX	360	1.13	MHF	1.32	1.33	1.34	1.99	2.05	2.12
274	822EKQ3700000001H3	356	822EKR3700000001H3	438	822EKP3700000001H3	I-PEX	370	1.13	MHF	1.35	1.36	1.38	2.04	2.09	2.17
275	822EKQ3800000001H3	357	822EKR3800000001H3	439	822EKP3800000001H3	I-PEX	380	1.13	MHF	1.38	1.39	1.41	2.09	2.14	2.22
276	822EKQ3900000001H3	358	822EKR3900000001H3	440	822EKP3900000001H3	I-PEX	390	1.13	MHF	1.41	1.43	1.44	2.13	2.19	2.27
277	822EKQ4000000001H3	359	822EKR4000000001H3	441	822EKP4000000001H3	I-PEX	400	1.13	MHF	1.44	1.46	1.47	2.18	2.24	2.32
278	822EKQ4100000001H3	360	822EKR4100000001H3	442	822EKP4100000001H3	I-PEX	410	1.13	MHF	1.47	1.49	1.50	2.23	2.28	2.37
279	822EKQ4200000001H3	361	822EKR4200000001H3	443	822EKP4200000001H3	I-PEX	420	1.13	MHF	1.51	1.52	1.53	2.27	2.33	2.42
280	822EKQ4300000001H3	362	822EKR4300000001H3	444	822EKP4300000001H3	I-PEX	430	1.13	MHF	1.54	1.55	1.57	2.32	2.38	2.47
281	822EKQ4400000001H3	363	822EKR4400000001H3	445	822EKP4400000001H3	I-PEX	440	1.13	MHF	1.57	1.58	1.60	2.36	2.43	2.52
282	822EKQ4500000001H3	364	822EKR4500000001H3	446	822EKP4500000001H3	I-PEX	450	1.13	MHF	1.60	1.62	1.63	2.41	2.48	2.57
283	822EKQ4600000001H3	365	822EKR4600000001H3	447	822EKP4600000001H3	I-PEX	460	1.13	MHF	1.63	1.65	1.66	2.46	2.52	2.62
284	822EKQ4700000001H3	366	822EKR4700000001H3	448	822EKP4700000001H3	I-PEX	470	1.13	MHF	1.66	1.68	1.69	2.50	2.57	2.67
285	822EKQ4800000001H3	367	822EKR4800000001H3	449	822EKP4800000001H3	I-PEX	480	1.13	MHF	1.69	1.71	1.72	2.55	2.62	2.72
286	822EKQ4900000001H3	368	822EKR4900000001H3	450	822EKP4900000001H3	I-PEX	490	1.13	MHF	1.72	1.74	1.76	2.60	2.67	2.77
287	822EKQ5000000001H3	369	822EKR5000000001H3	451	822EKP5000000001H3	I-PEX	500	1.13	MHF	1.75	1.77	1.79	2.64	2.72	2.82
288	822EKQ5100000001H3	370	822EKR5100000001H3	452	822EKP5100000001H3	I-PEX	510	1.13	MHF	1.79	1.81	1.82	2.69	2.76	2.87
289	822EKQ5200000001H3	371	822EKR5200000001H3	453	822EKP5200000001H3	I-PEX	520	1.13	MHF	1.82	1.84	1.85	2.73	2.81	2.92
290	822EKQ5300000001H3	372	822EKR5300000001H3	454	822EKP5300000001H3	I-PEX	530	1.13	MHF	1.85	1.87	1.88	2.78	2.86	2.97
291	822EKQ5400000001H3	373	822EKR5400000001H3	455	822EKP5400000001H3	I-PEX	540	1.13	MHF	1.88	1.90	1.91	2.83	2.91	3.02
292	822EKQ5500000001H3	374	822EKR5500000001H3	456	822EKP5500000001H3	I-PEX	550	1.13	MHF	1.91	1.93	1.95	2.87	2.96	3.07
293	822EKQ5600000001H3	375	822EKR5600000001H3	457	822EKP5600000001H3	I-PEX	560	1.13	MHF	1.94	1.96	1.98	2.92	3.00	3.12
294	822EKQ5700000001H3	376	822EKR5700000001H3	458	822EKP5700000001H3	I-PEX	570	1.13	MHF	1.97	2.00	2.01	2.97	3.05	3.17
295	822EKQ5800000001H3	377	822EKR5800000001H3	459	822EKP5800000001H3	I-PEX	580	1.13	MHF	2.00	2.03	2.04	3.01	3.10	3.22
296	822EKQ5900000001H3	378	822EKR5900000001H3	460	822EKP5900000001H3	I-PEX	590	1.13	MHF	2.03	2.06	2.07	3.06	3.15	3.27
297	822EKQ6000000001H3	379	822EKR6000000001H3	461	822EKP6000000001H3	I-PEX	600	1.13	MHF	2.07	2.09	2.11	3.11	3.20	3.32
298	822EKQ6100000001H3	380	822EKR6100000001H3	462	822EKP6100000001H3	I-PEX	610	1.13	MHF	2.10	2.12	2.14	3.15	3.24	3.36
299	822EKQ6200000001H3	381	822EKR6200000001H3	463	822EKP6200000001H3	I-PEX	620	1.13	MHF	2.13	2.15	2.17	3.20	3.29	3.41
300	822EKQ6300000001H3	382	822EKR6300000001H3	464	822EKP6300000001H3	I-PEX	630	1.13	MHF	2.16	2.18	2.20	3.24	3.34	3.46
301	822EKQ6400000001H3	383	822EKR6400000001H3	465	822EKP6400000001H3	I-PEX	640	1.13	MHF	2.19	2.22	2.23	3.29	3.39	3.51
302	822EKQ6500000001H3	384	822EKR6500000001H3	466	822EKP6500000001H3	I-PEX	650	1.13	MHF	2.22	2.25	2.26	3.34	3.43	3.56
303	822EKQ6600000001H3	385	822EKR6600000001H3	467	822EKP6600000001H3	I-PEX	660	1.13	MHF	2.25	2.28	2.30	3.38	3.48	3.61
304	822EKQ6700000001H3	386	822EKR6700000001H3	468	822EKP6700000001H3	I-PEX	670	1.13	MHF	2.28	2.31	2.33	3.43	3.53	3.66
305	822EKQ6800000001H3	387	822EKR6800000001H3	469	822EKP6800000001H3	I-PEX	680	1.13	MHF	2.31	2.34	2.36	3.48	3.58	3.71
306	822EKQ6900000001H3	388	822EKR6900000001H3	470	822EKP6900000001H3	I-PEX	690	1.13	MHF	2.34	2.37	2.39	3.52	3.63	3.76
307	822EKQ7000000001H3	389	822EKR7000000001H3	471	822EKP7000000001H3	I-PEX	700	1.13	MHF	2.38	2.41	2.42	3.57	3.67	3.81
308	822EKQ7100000001H3	390	822EKR7100000001H3	472	822EKP7100000001H3	I-PEX	710	1.13	MHF	2.41	2.44	2.45	3.61	3.72	3.86
309	822EKQ7200000001H3	391	822EKR7200000001H3	473	822EKP7200000001H3	I-PEX	720	1.13	MHF	2.44	2.47	2.49	3.66	3.77	3.91
310	822EKQ7300000001H3	392	822EKR7300000001H3	474	822EKP7300000001H3	I-PEX	730	1.13	MHF	2.47	2.50	2.52	3.71	3.82	3.96
311	822EKQ7400000001H3	393	822EKR7400000001H3	475	822EKP7400000001H3	I-PEX	740	1.13	MHF	2.50	2.53	2.55	3.75	3.87	4.01
312	822EKQ7500000001H3	394	822EKR7500000001H3	476	822EKP7500000001H3	I-PEX	750	1.13	MHF	2.53	2.56	2.58	3.80	3.91	4.06
313	822EKQ7600000001H3	395	822EKR7600000001H3	477	822EKP7600000001H3	I-PEX	760	1.13	MHF	2.56	2.60	2.61	3.85	3.96	4.11
314	822EKQ7700000001H3	396	822EKR7700000001H3	478	822EKP7700000001H3	I-PEX	770	1.13	MHF	2.59	2.63	2.64	3.89	4.01	4.16
315	822EKQ7800000001H3	397	822EKR7800000001H3	479	822EKP7800000001H3	I-PEX	780	1.13	MHF	2.62	2.66	2.68	3.94	4.06	4.21
316	822EKQ7900000001H3	398	822EKR7900000001H3	480	822EKP7900000001H3	I-PEX	790	1.13	MHF	2.66	2.69	2.71	3.98	4.11	4.26
317	822EKQ8000000001H3	399	822EKR8000000001H3	481	822EKP8000000001H3	I-PEX	800	1.13	MHF	2.69	2.72	2.74	4.03	4.15	4.31
318	822EKQ8100000001H3	400	822EKR8100000001H3	482	822EKP8100000001H3	I-PEX	810	1.13	MHF	2.72	2.75	2.77	4.08	4.20	4.36
319	822EKQ8200000001H3	401	822EKR8200000001H3	483	822EKP8200000001H3	I-PEX	820	1.13	MHF	2.75	2.79	2.80	4.12	4.25	4.41
320	822EKQ8300000001H3	402	822EKR8300000001H3	484	822EKP8300000001H3	I-PEX	830	1.13	MHF	2.78	2.82	2.83	4.17	4.30	4.46
321	822EKQ8400000001H3	403	822EKR8400000001H3	485	822EKP8400000001H3	I-PEX	840	1.13	MHF	2.81	2.85	2.87	4.22	4.34	4.51
322	822EKQ8500000001H3	404	822EKR8500000001H3	486	822EKP8500000001H3	I-PEX	850	1.13	MHF	2.84	2.88	2.90	4.26	4.39	4.56
323	822EKQ8600000001H3	405	822EKR8600000001H3	487	822EKP8600000001H3	I-PEX	860	1.13	MHF	2.87	2.91	2.93	4.31	4.44	4.61
324	822EKQ8700000001H3	406	822EKR8700000001H3	488	822EKP8700000001H3	I-PEX	870	1.13	MHF	2.90	2.94	2.96	4.36	4.49	4.66
325	822EKQ8800000001H3	407	822EKR8800000001H3	489	822EKP8800000001H3	I-PEX	880	1.13	MHF	2.94	2.97	2.99	4.40	4.54	4.71
326	822EKQ8900000001H3	408	822EKR8900000001H3	490	822EKP8900000001H3	I-PEX	890	1.13	MHF	2.97	3.01	3.02	4.45	4.58	4.76
327	822EKQ9000000001H3	409	822EKR9000000001H3	491	822EKP9000000001H3	I-PEX	900	1.13	MHF	3.00	3.04	3.06	4.49	4.63	4.81
328	822EKQ9100000001H3	410	822EKR9100000001H3	492	822EKP9100000001H3	I-PEX	910	1.13	MHF	3.03	3.07	3.09	4.54	4.68	4.86

3. The EUT has three sets of antennas and there are two antennas for each set.
4. Only the lowest gain antenna Set 1 was selected to test and record in this report.

For 2.4GHz function:

For IEEE 802.11b/g/n mode (2TX/2RX)

Chain 1 and Chain 2 can be used as transmitting/receiving antenna.

Chain 1 and Chain 2 could transmit/receive simultaneously.

For 5GHz function:

For IEEE 802.11a/n mode (2TX/2RX)

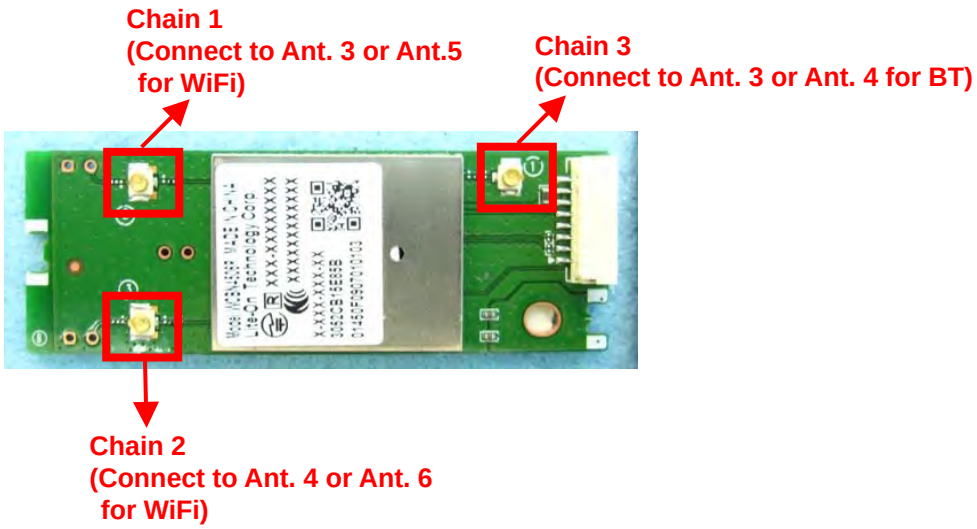
Chain 1 and Chain 2 can be used as transmitting/receiving antenna.

Chain 1 and Chain 2 could transmit/receive simultaneously.

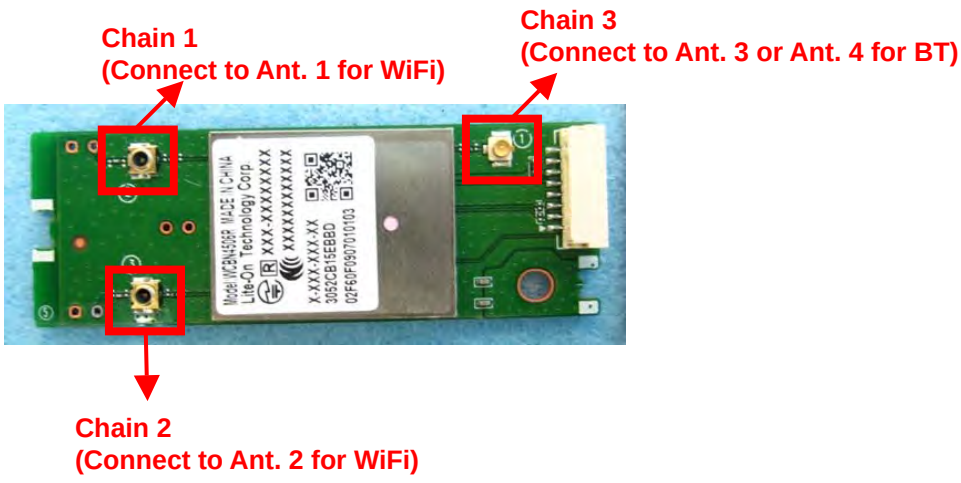
For Bluetooth function: (1TX/1RX)

Only Chain 3 can be used as transmitting/receiving antenna.

For EUT 1:



For EUT 2:



1.1.3 DFS Band Carrier Frequencies

There are two bandwidth systems.

For 20MHz bandwidth systems, use Channel 52, 56, 60, 64, 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140, 144.

For 40MHz bandwidth systems, use Channel 54, 62, 102, 110, 118, 126, 134, 142.

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
5250~5350 MHz Band 2	52	5260 MHz	60	5300 MHz
	54	5270 MHz	62	5310 MHz
	56	5280 MHz	64	5320 MHz
5470~5725 MHz Band 3	100	5500 MHz	124	5620 MHz
	102	5510 MHz	126	5630 MHz
	104	5520 MHz	128	5640 MHz
	108	5540 MHz	132	5660 MHz
	110	5550 MHz	134	5670 MHz
	112	5560 MHz	136	5680 MHz
	116	5580 MHz	140	5700 MHz
	118	5590 MHz	142	5710 MHz
	120	5600 MHz	144	5720 MHz

1.1.4 Table for Multiple Listing

The brand/model names in the following table are all refer to the identical product.

EUT	Model Name	WiFi Antenna (Internal)	WiFi Antenna (External)	BT Antenna (External)
1	WCBN4506R	X	V	V
2		V	X	V

Note: EUT 2' s gain is low than that of EUT 1, so only EUT 2 was tested and recorded in this report.

1.2 Accessories

N/A

1.3 Support Equipment

Support Equipment				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
1	Notebook	DELL	E4300	DoC
2	Notebook	DELL	E4300	DoC
3	WLAN AP	ALPHA	WMC-AC02	RRK-2012070022

1.4 Testing Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC KDB 905462 D02 UNII DFS Compliance Procedures New Rules v01r02

1.5 Testing Location Information

Testing Location					
☐	HWA YA	ADD : No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL : 886-3-327-3456 FAX : 886-3-327-0973			
☒	JHUBEI	ADD : No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C. TEL : 886-3-656-9065 FAX : 886-3-656-9085			
Test Condition		**Test Site No.**	**Test Engineer**	**Test Environment**	**Test Date**
DFS Site		DF01-CB	YC Chen	26°C / 47%	12-Oct-15 ~ 13-Oct-15

2 Test Configuration of EUT

2.1 Test Channel Frequencies Configuration

Test Channel Frequencies Configuration	
IEEE Std.	**Test Channel Freq. (MHz)**
802.11n (HT40)	5510 MHz

2.2 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests	
Tests Item	Dynamic Frequency Selection (DFS)
Test Condition	Radiated measurement The EUT shall be configured to operate at the highest transmitter output power setting. If more than one antenna assembly is intended for this power setting, the gain of the antenna assembly with the lowest gain shall be used. The DFS radar test signals have been aligned to the direction corresponding to the EUT's maximum antenna gain.
Modulation Mode	802.11n (HT40)

3 Dynamic Frequency Selection (DFS) Test Result

3.1 General DFS Information

3.1.1 DFS Parameters

Table D.1: DFS requirement values	
Parameter	**Value**
Non-occupancy period	Minimum 30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds (Note 1).
Channel Closing Transmission Time	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second periods. (Notes 1 and 2).
U-NII Detection Bandwidth	Minimum 100% of the 99% power bandwidth (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 Channel changes (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 1 is used and for each frequency step the minimum percentage of detection is 90%. Measurements are performed with no data traffic.	

Table D.2: Interference threshold values	
Maximum Transmit Power	**Value (see note)**
EIRP ≥ 200 mW	-64 dBm
EIRP < 200 mW and PSD < 10dBm/MHz	-62 dBm
EIRP < 200 mW and PSD >= 10dBm/MHz	-64 dBm
Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna. Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response. Note3: EIRP is based on the highest antenna gain. For MIMO devices refer to KDB Publication 662911D01.	

3.1.2 Applicability of DFS Requirements Prior to Use of a Channel

Requirement	DFS 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

3.1.3 Applicability of DFS Requirements during Normal Operation

Requirement	DFS Operational mode		
	Master	Client without radar detection	Client with radar detection
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 with multiple bandwidth modes	Master Device or Client with Radar Detection	Client Without Radar Detection
U-NII Detection Bandwidth and Statistical Performance Check	All BW modes must be tested	Not required
Channel Move Time and Channel Closing Transmission Time	Test using widest BW mode available	Test using the widest BW mode available for the link
All other tests	Any single BW mode	Not required
Note: Frequencies selected for statistical performance check (Section 7.8.4) should 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 each of the bonded 20 MHz channels and the channel center frequency.		

3.1.4 Channel Loading/Data Streaming

☒	IP Based (Load Based) - stream the test file from the Master to the Client.
	☐ The data file (MPEG-4) has been transmitting in a streaming mode.
	☐ Software to ping the client is permitted to simulate data transfer with random ping intervals.
	☒ Minimum channel loading of approximately 17%.
	☐ Unicast protocol has been used.
☐	Frame Based - stream the test file from the Master to the Client.
	☐ fixed talk/listen ratio, set the ratio to 45%/55%

3.2 Radar Test Waveform Calibration

3.2.1 Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (µsec)	PRI (µsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Trials
0	1	1428	18	See Note 1	See Note 1
1A	1	15 unique PRI in KDB 905462 D02 Table 5a	$Roundup\left\{\left(\frac{1}{360}\right)\times\left(\frac{19\times10^6}{PRI}\right)\right\}$	60%	15
1B	1	15 unique PRI within 518-3066, Excluding 1A PRI		60%	15
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
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.

A minimum of 30 unique waveforms are required for each of the short pulse radar types 2 through 4. For short pulse radar type 1, the same waveform is used a minimum of 30 times. If more than 30 waveforms are used for short pulse radar types 2 through 4, then each additional waveform must also be unique and not repeated from the previous waveforms. The aggregate is the average of the percentage of successful detections of short pulse radar types 1-4.

3.2.2 Long Pulse Radar Test Waveform

Radar Type	Pulse Width (µsec)	Chirp Width (MHz)	PRI (µsec)	Number of 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

Each waveform is defined as follows:

- The transmission period for the Long Pulse Radar test signal is 12 seconds.
- There are a total of 8 to 20 Bursts in the 12 second period, with the number of Bursts being randomly chosen. This number is Burst_Count.
- Each Burst consists of 1 to 3 pulses, with the number of pulses being randomly chosen. Each Burst within the 12 second sequence may have a different number of pulses.
- The pulse width is between 50 and 100 microseconds, with the pulse width being randomly chosen. Each pulse within a Burst will have the same pulse width. Pulses in different Bursts may have different pulse widths.
- Each pulse has a linear FM chirp between 5 and 20 MHz, with the chirp width being randomly chosen. Each pulse within a Burst will have the same chirp width. Pulses in different Bursts may have different chirp widths. The chirp is centered on the pulse. For example, with a radar frequency of 5300 MHz and a 20 MHz chirped signal, the chirp starts at 5290 MHz and ends at 5310 MHz.
- If more than one pulse is present in a Burst, the time between the pulses will be between 1000 and 2000

microseconds, with the time being randomly chosen. If three pulses are present in a Burst, the time between the first and second pulses is chosen independently of the time between the second and third pulses.

- The 12 second transmission period is divided into even intervals. The number of intervals is equal to Burst_Count. Each interval is of length (12,000,000 / Burst_Count) microseconds. Each interval contains one Burst. The start time for the Burst, relative to the beginning of the interval, is between 1 and [(12,000,000 / Burst_Count) – (Total Burst Length) + (One Random PRI Interval)] microseconds, with the start time being randomly chosen. The step interval for the start time is 1 microsecond. The start time for each Burst is chosen independently.

3.2.3 Frequency Hopping Radar Test Waveform

Radar Type	Pulse Width (µsec)	PRI (µsec)	Pulses per Hop	Hopping Rate (kHz)	Hopping Sequence Length (ms)	Minimum Percentage of Successful Detection	Minimum Trials
6	1	333	9	0.333	300	70%	30

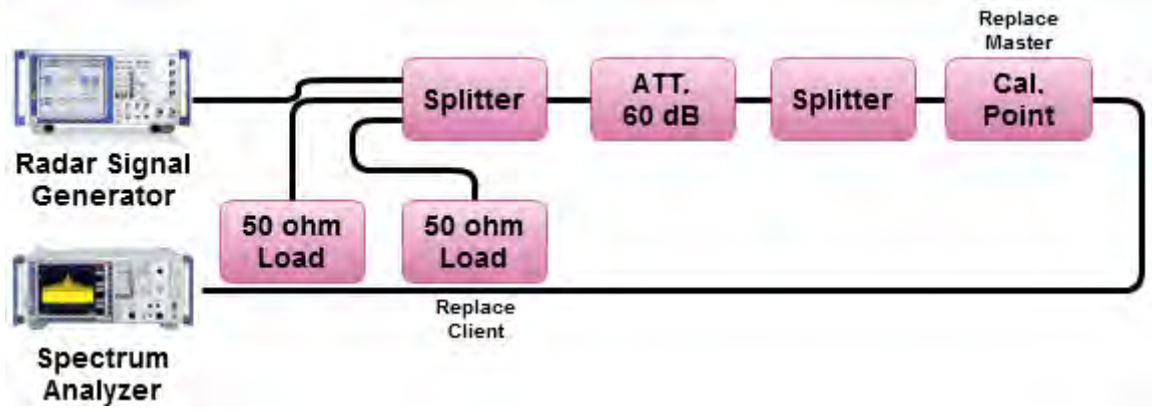
The FCC Type 6 waveform uses a static waveform with 100 bursts in the instruments ARB. In addition, the RF list mode is operated with a list containing 100 frequencies from a randomly generated list and it had be ensured that at least one of the random frequencies falls into the UNII Detection Bandwidth of the DUT. Each burst from the waveform file initiates a trigger pulse at the beginning that switches the RF list from one item to the next one.

3.2.4 DFS Threshold Level

DFS Threshold Level	
DFS Threshold level: -63 dBm	☐ at the antenna connector
	☒ in front of the antenna
The Interference **Radar Detection Threshold Level** is is *-64 dBm + 0 [dBi] + 1 dB* = -63 dBm. That had been taken into account the output power range and antenna gain.	

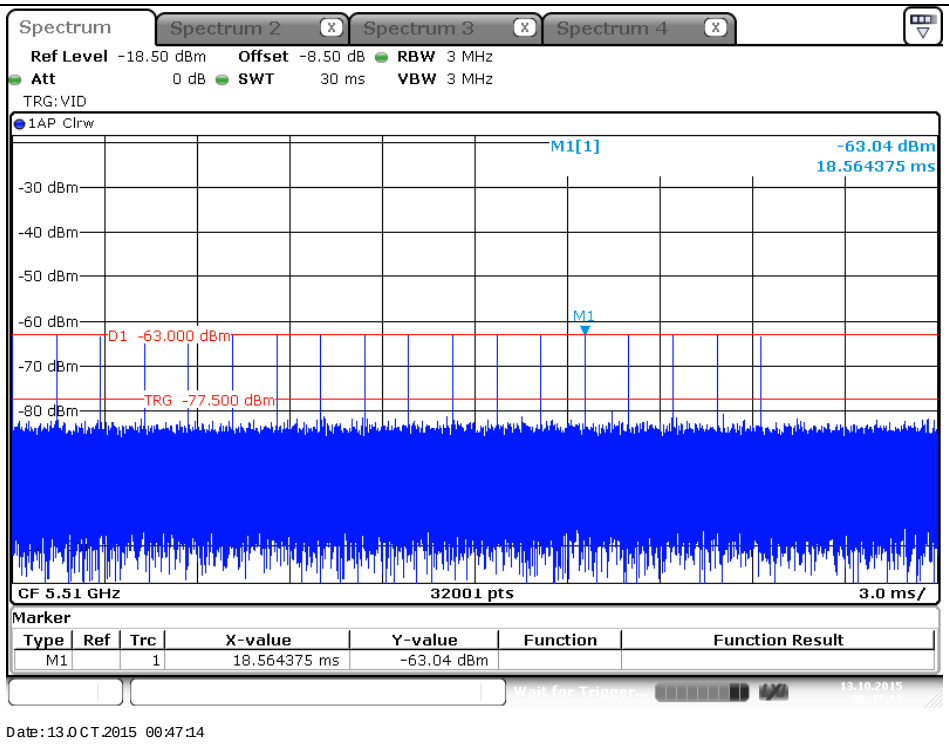
3.2.5 Calibration Setup

Client Conducted Calibration Setup



3.2.6 Radar Waveform calibration Plot

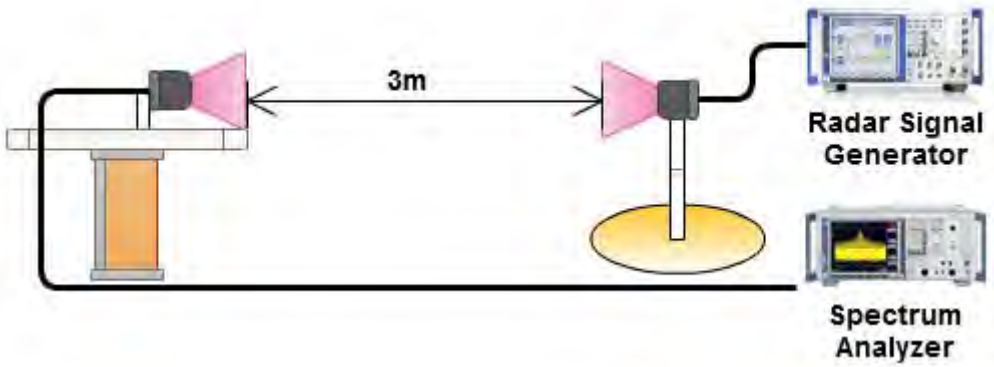
Modulation Mode: 802.11n (HT40)	Test Frequency: 5510 MHz
Radar #0 DFS detection threshold level	



3.2.7 Test Setup

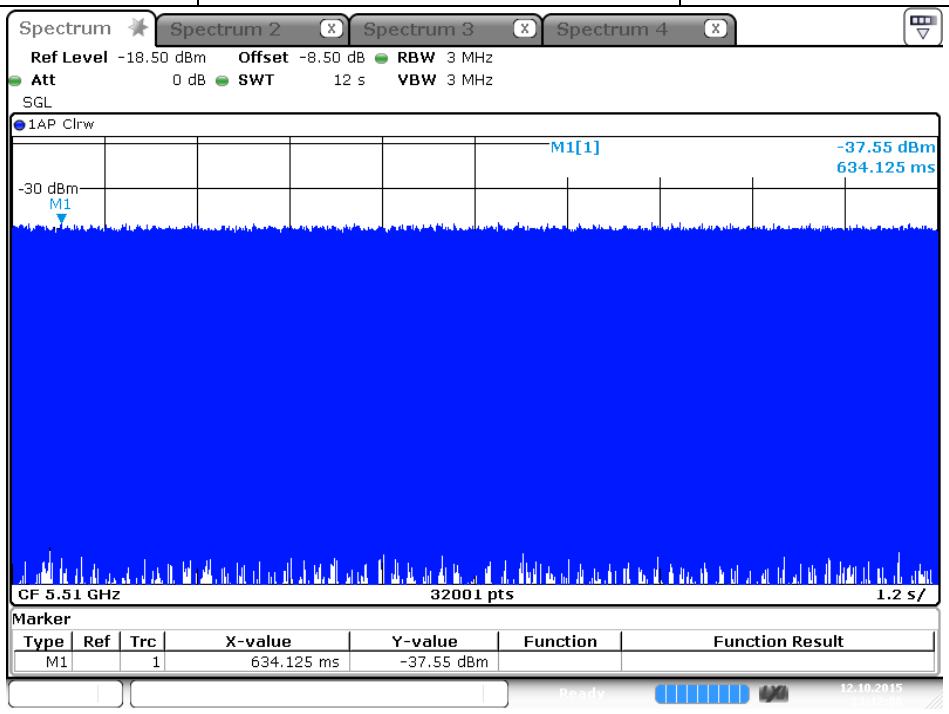
A spectrum analyzer is used as a monitor to verify that the EUT has vacated the Channel within the (Channel Closing Transmission Time and Channel Move Time, and does not transmit on a Channel during the Non-Occupancy Period after the detection and Channel move.

Client Radiated Calibration Setup



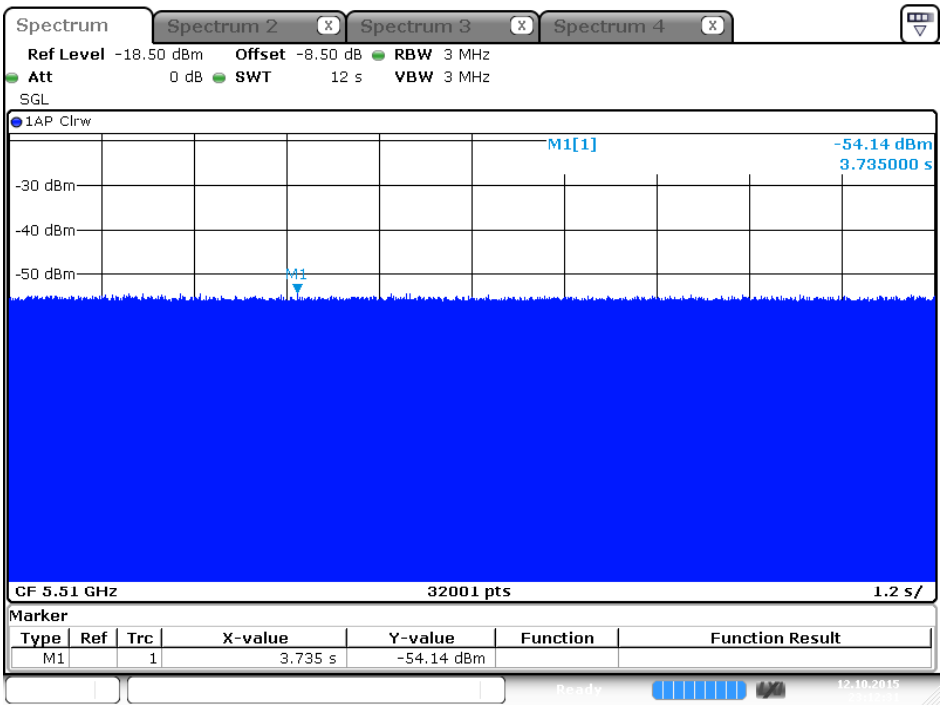
3.2.8 Data traffic Plot

EUT Data traffic Plot	Modulation Mode: 802.11n (HT40)	Test Frequency: 5510 MHz



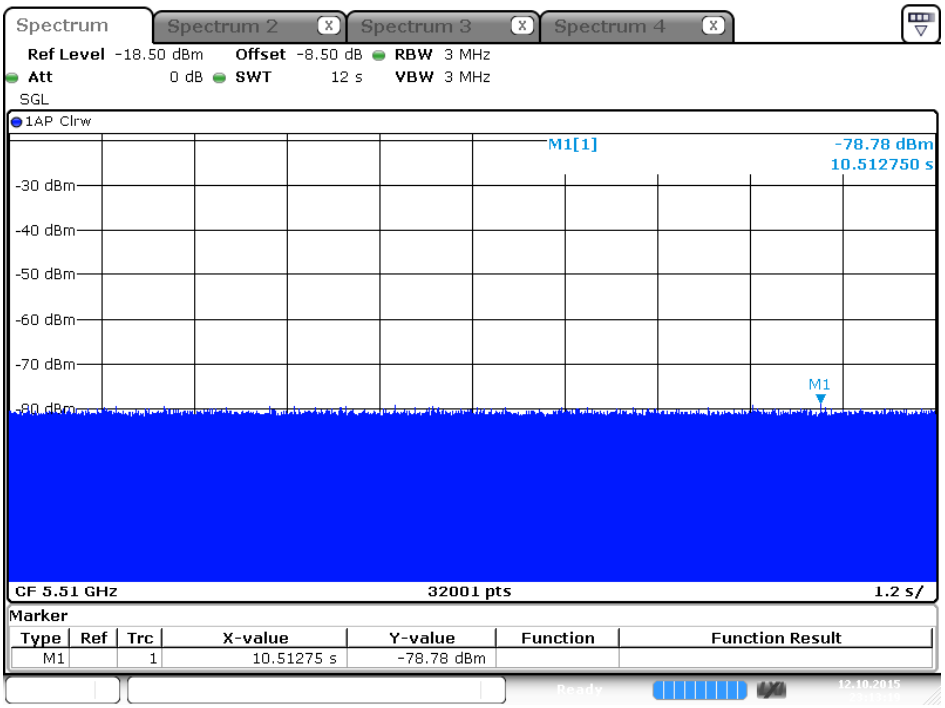
Date: 12.OCT.2015 23:12:00

Master Data Traffic Plot	Modulation Mode: 802.11n (HT40)	Test Frequency: 5510 MHz



Date: 12.OCT.2015 23:12:30

Without Data Traffic Plot	Modulation Mode: 802.11n (HT40)	Test Frequency: 5510 MHz



3.3 In-service Monitoring

3.3.1 In-service Monitoring Limit

In-service Monitoring Limit	
Channel Move Time	10 sec
Channel Closing Transmission Time	200 ms + an aggregate of 60 ms over remaining 10 sec periods.
Non-occupancy period	Minimum 30 minutes

3.3.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.3.3 Test Procedures

Test Method	
☒	Verified during In-Service Monitoring; Channel Closing Transmission Time, Channel Move Time. Client Device will associate with the EUT. Observe the transmissions of the EUT at the end of the radar Burst on the Operating Channel for duration greater than 10 seconds. Measure and record the transmissions from the EUT during the observation time (Channel Move Time). Compare the Channel Move Time and Channel Closing Transmission Time limits.
☒	Verified during In-Service Monitoring; Channel Closing Transmission Time, Channel Move Time. One 12 sec plot needs to be reported for the Short Pulse Radar Types 0.And zoom-in a 60 ms plot verified channel closing time for the aggregate transmission time starting from 200ms after the end of the radar signal to the completion of the channel move.
☒	Verified during In-Service Monitoring; Non-Occupancy Period. Client Device will associate with the EUT. Observe the transmissions of the EUT at the end of the radar Burst on the Operating Channel for duration greater than 10 seconds. Measure and record the transmissions from the EUT during the observation time (Non-Occupancy Period). Compare the Non-Occupancy Period limits.

3.3.4 Test Result of In-service Monitoring

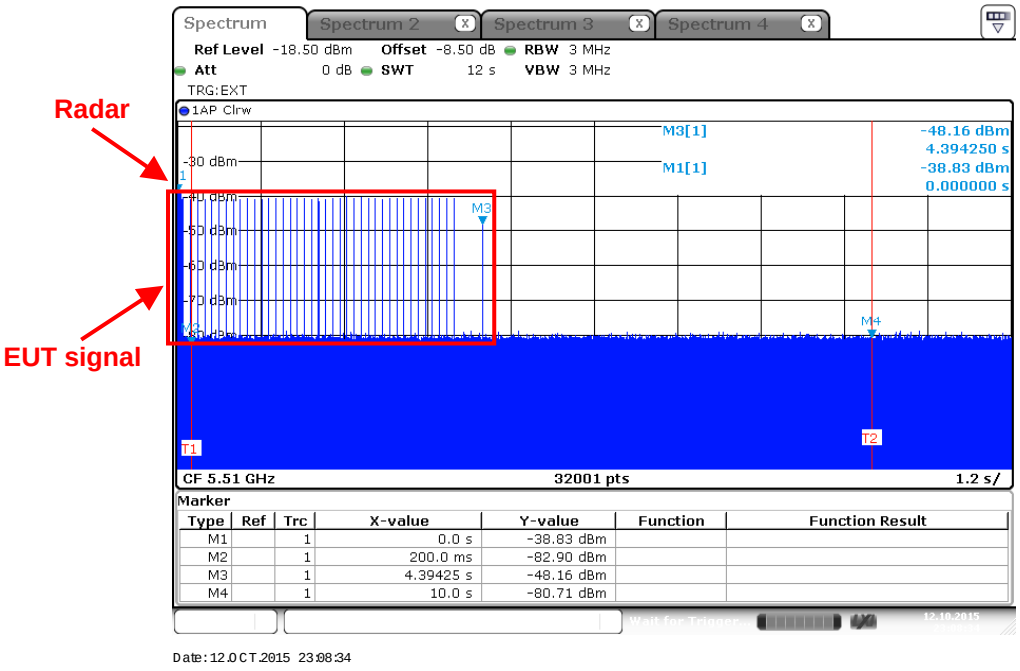
Modulation Mode: 802.11n (HT40)

Parameter	Test Result	Limit
	Type 0	
Test Channel (MHz)	5510 MHz	-
Channel Move Time (sec.)	4.394	< 10s
Channel Closing Transmission Time (ms) (Note)	23.125	＜ 60ms
Non-Occupancy Period (min.)	≧30	≧ 30 min

Note: 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 seconds period. The aggregate duration of control signals will not count quiet periods in between transmissions.

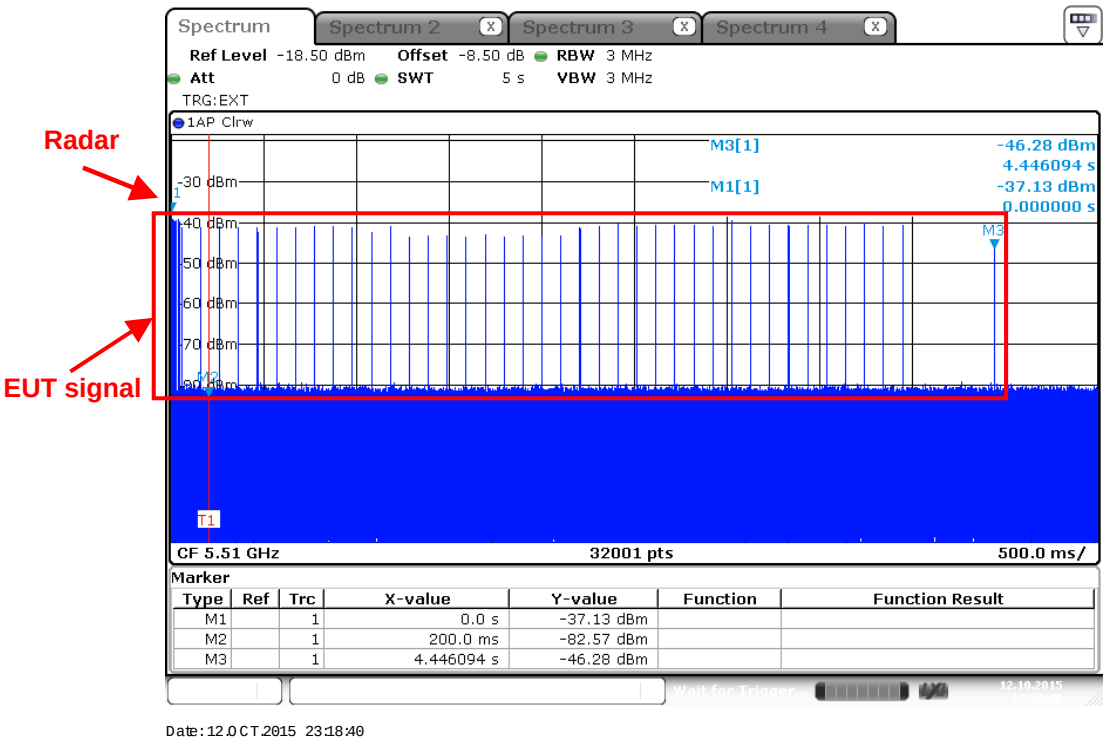
3.3.5 Test Plot of In-Service Monitoring for Channel Move Time

Modulation Mode	Freq.	Radar Type
802.11n (HT40)	5510 MHz	0



3.3.6 Test Plot of In-Service Monitoring for Channel Closing Transmission Time

Modulation Mode	Freq.	Radar Type
802.11n (HT40)	5510 MHz	0
Channel Closing Transmission Time is comprised of 200 ms starting at the beginning of the Channel Move Time plus 60ms additional intermittent control signals		



Dwell is the dwell time per spectrum analyzer sampling bin.

S is the sweep time

B is the number of spectrum analyzer sampling bins

C is the intermittent control signals of Channel Closing Transmission Time

N is the number of spectrum analyzer sampling bins (intermittent control signals) showing a U-NII transmission

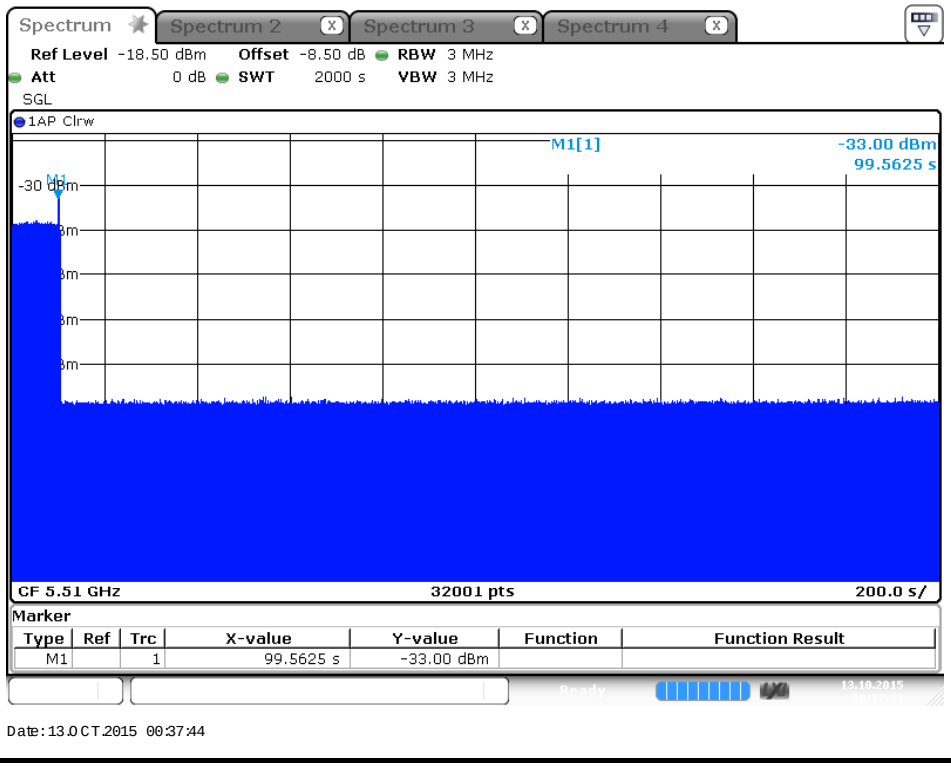
Dwell (0.15625 ms)= S (5000 ms) / B (32000)

C (23.125 ms) = N (148) X Dwell (0.15625 ms)

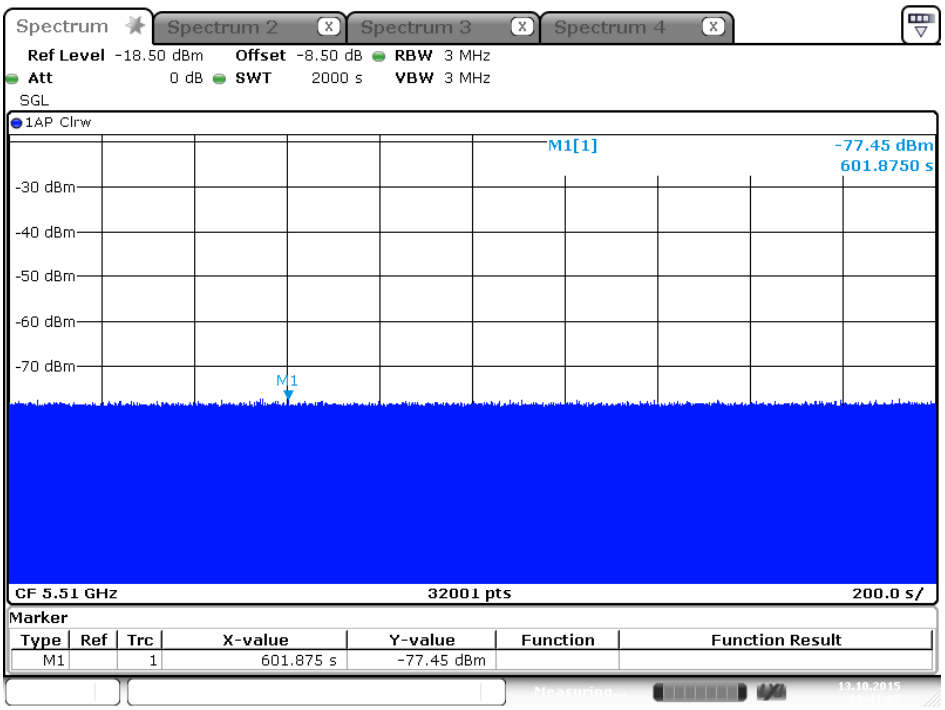
3.3.7 Test Plot of In-Service Monitoring for Non-Occupancy Period

Modulation Mode	Freq.
802.11n (HT40)	5510 MHz

Non-Occupancy Period
During the 30 minutes observation time, UUT did not make any transmissions on a channel after a radar signal was detected on that channel by either the Channel Availability Check or the In-Service Monitoring.



Non-associated test
Master was off.
During the 30 minutes observation time, The UUT did not make any transmissions in the DFS band after UUT power up.



4 Test Equipment and Calibration Data

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Spectrum analyzer	R&S	FSP40	100142	9kHz~40GHz	Oct. 15, 2014	Radiated (DF01-CB)
Signal generator	R&S	SMU200A	102782	25MHz-6GHz	Nov. 29, 2014	Radiated (DF01-CB)
RF Power Divider	ANAREN	2 Way	DFS-01-DV-02	1GHz ~ 6GHz	Jan. 10, 2015	Radiated (DF01-CB)
RF Power Divider	MTJ	2Way	DFS-01-DV-03	1GHz ~ 6GHz	Jan. 10, 2015	Radiated (DF01-CB)
RF Power Divider	ANAREN	4 Way	DFS-01-DV-01	1GHz ~ 6GHz	Jan. 10, 2015	Radiated (DF01-CB)
RF Cable-high	Woken	RG402	High Cable-53	1 GHz –18 GHz	Nov. 15, 2014	Radiated (DF01-CB)
RF Cable-high	Woken	RG402	High Cable-54	1 GHz –18 GHz	Nov. 15, 2014	Radiated (DF01-CB)
RF Cable-high	Woken	RG402	High Cable-56	1 GHz –18 GHz	Nov. 15, 2014	Radiated (DF01-CB)
RF Cable-high	Woken	RG402	High Cable-60	1 GHz –18 GHz	Nov. 15, 2014	Radiated (DF01-CB)

Note: Calibration Interval of instruments listed above is one year.

5 Measurement Uncertainty

Test Items	Uncertainty	Remark
Radiated Emission	2.9 dB	Confidence levels of 95%