Co-location Report

FCC ID: Q9DAPIN0504505

APPLICANT: Hewlett Packard Enterprise Company

Application Type: Certification

Product: ACCESS POINT

Model No.: APIN0504, APIN0505

Brand Name: aruba a Hewlett Packard Enterprise company, Hewlett Packard Enterprise

FCC Rule Part(s): Part15 Subpart C (Section 15.247)
Part15 Subpart E (Section 15.407)

Test Date: June 10 ~ July 10, 2019

Reviewed By: Paddy Chen
(Paddy Chen)

Approved By: Chenz Ker
(Chenz Ker)

Testing Laboratory
3261

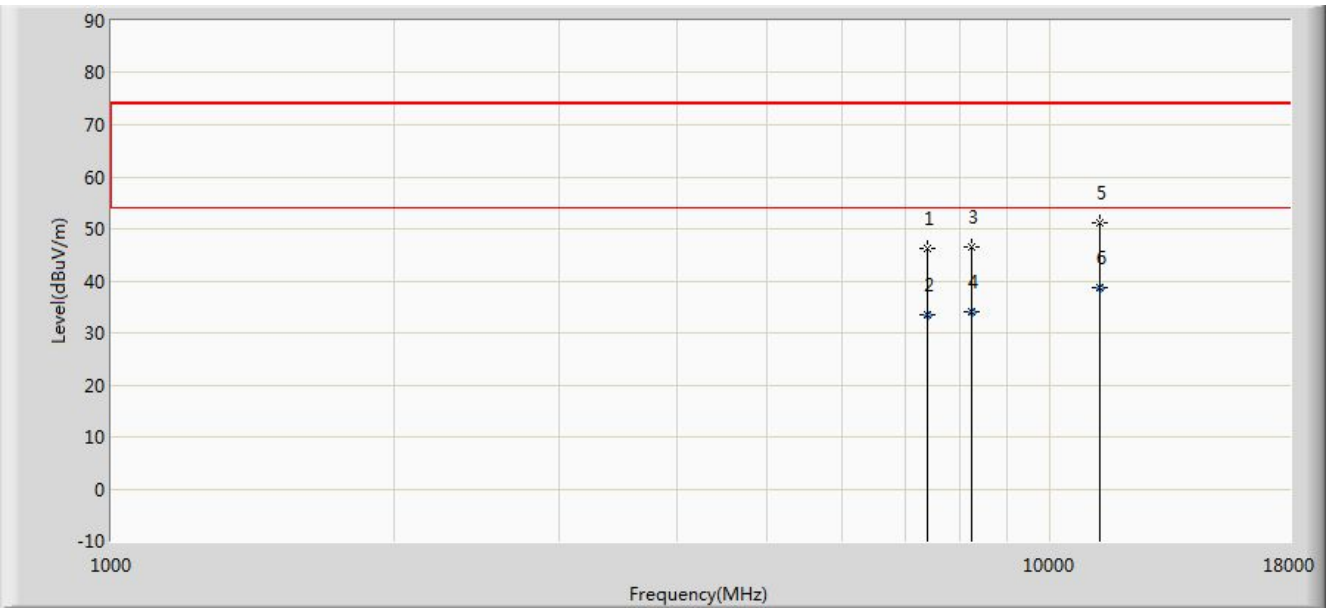
The test results relate only to the samples tested.
This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4-2013. Test results reported herein relate only to the item(s) tested.
The test report shall not be reproduced except in full without the written approval of MRT Technology (Taiwan) Co., Ltd.

Revision History

Report No.	Version	Description	Issue Date	Note
1906TW0102-U6	Rev. 01	Initial report	07-15-2019	Valid

1. Test Result of Radiated Emissions for Co-located

Test Mode:	2.4GHz, 5GHz Wi-Fi + BLE Transmit	Test Site:	AC1
Test Engineer:	Kevin	Polarity:	Horizontal
Antenna Type:	Omni Antenna (M/N: AP-ANT-20W)	Model No.:	APIN0504
Remark:	There is the ambient noise within frequency range 9kHz~30MHz and 18GHz~40GHz, the permissible value is not show in the report.		



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			7409.000	46.325	34.600	-27.675	74.000	11.725	PK
2			7409.635	33.368	21.854	-20.632	54.000	11.514	AV
3			8242.000	46.572	34.266	-27.428	74.000	12.306	PK
4			8242.745	34.028	21.689	-19.972	54.000	12.339	AV
5			11276.500	51.297	33.759	-22.703	74.000	17.538	PK
6		*	11276.544	38.565	20.725	-15.435	54.000	17.840	AV

Note 1: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

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

Note 2: We selected the 2.4GHz and 5GHz worst-case mode of radiated spurious emissions in the DTS and UNII reports.

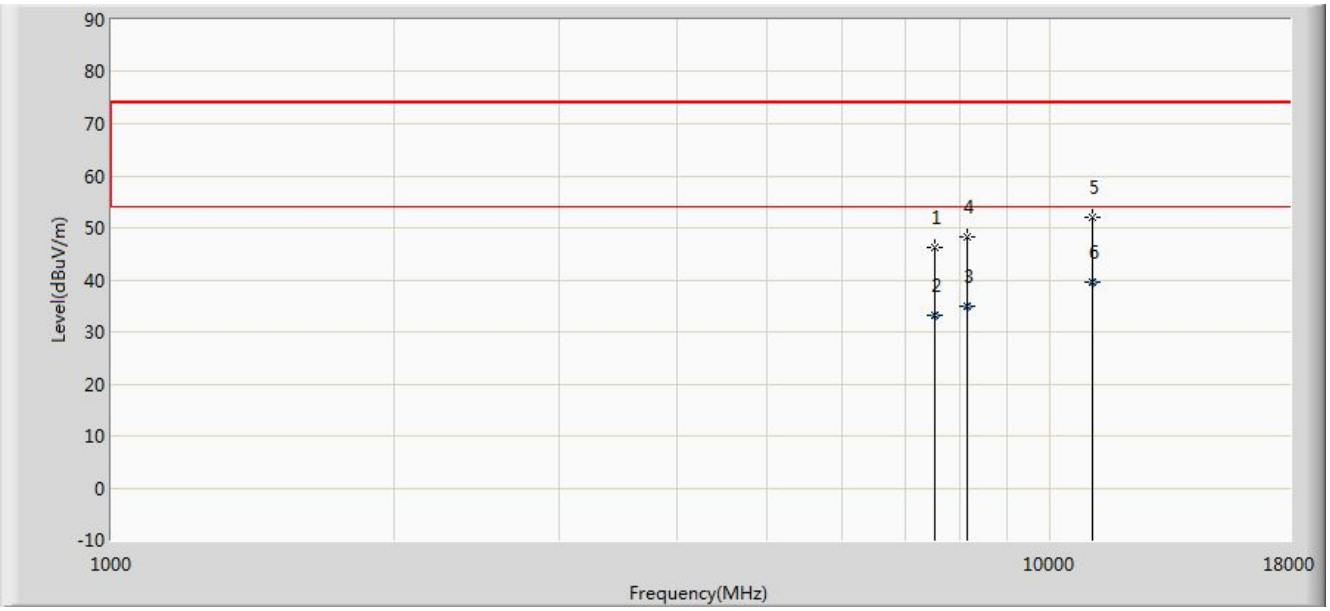
Note 3: 2.4GHz Wi-Fi 802.11n-HT20 Channel 2437MHz Power setting = 80;

5GHz Wi-Fi 802.11ac-VHT20 Channel 5825MHz Power setting = 78;

2.4GHz Bluetooth LE channel 2402MHz Power setting = 8;

Note 4: ZigBee and Bluetooth-LE can’t transmit simultaneously and Bluetooth-LE power higher than ZigBee, so we only assess the WIFI and Bluetooth-LE simultaneous transmission.

Test Mode:	2.4GHz, 5GHz Wi-Fi + BLE Transmit	Test Site:	AC1
Test Engineer:	Kevin	Polarity:	Vertical
Antenna Type:	Omni Antenna (M/N: AP-ANT-20W)	Model No.:	APIN0504
Remark:	There is the ambient noise within frequency range 9kHz~30MHz and 18GHz~40GHz, the permissible value is not show in the report.		



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			7536.500	46.367	34.495	-27.633	74.000	11.871	PK
2			7536.541	33.299	21.547	-20.701	54.000	11.752	AV
3			8165.417	34.878	22.574	-19.122	54.000	12.304	AV
4			8165.500	48.124	35.733	-25.876	74.000	12.391	PK
5			11098.000	52.083	34.514	-21.917	74.000	17.569	PK
6		*	11098.554	39.538	21.865	-14.462	54.000	17.673	AV

Note 1: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

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

Note 2: We selected the 2.4GHz and 5GHz worst-case mode of radiated spurious emissions in the DTS and UNII reports.

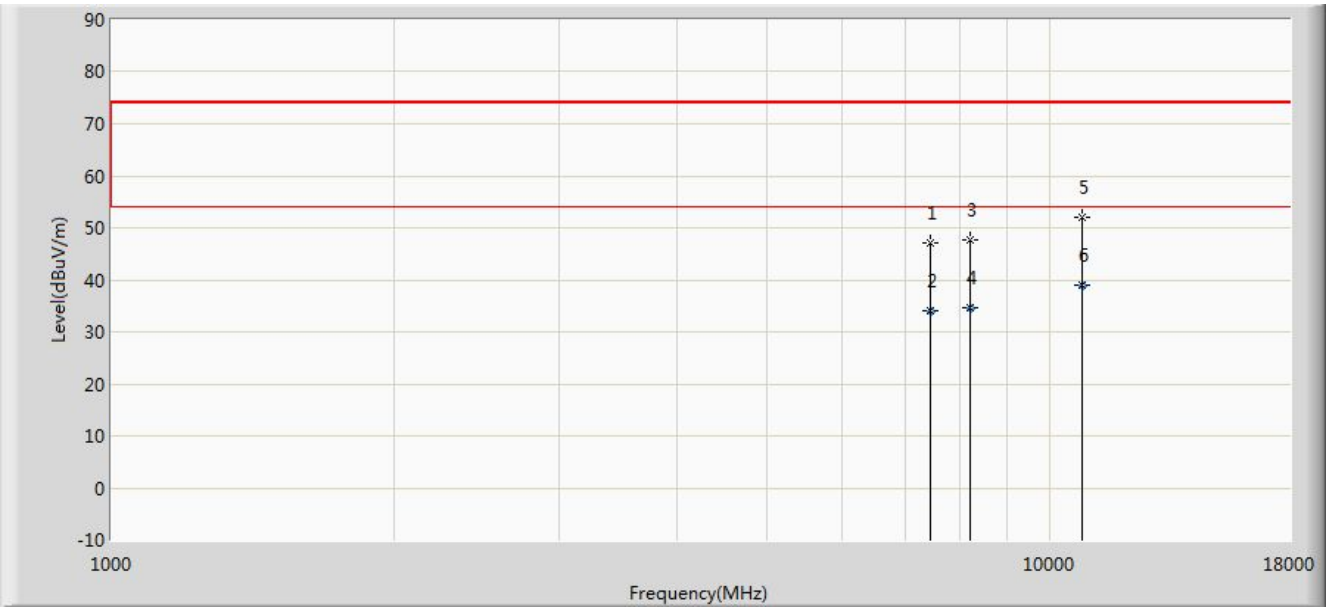
Note 3: 2.4GHz Wi-Fi 802.11n-HT20 Channel 2437MHz Power setting = 80;

5GHz Wi-Fi 802.11ac-VHT20 Channel 5825MHz Power setting = 78;

2.4GHz Bluetooth LE channel 2402MHz Power setting = 8;

Note 4: ZigBee and Bluetooth-LE can’t transmit simultaneously and Bluetooth-LE power higher than ZigBee, so we only assess the WIFI and Bluetooth-LE simultaneous transmission.

Test Mode:	2.4GHz, 5GHz Wi-Fi + BLE Transmit	Test Site:	AC1
Test Engineer:	Kevin	Polarity:	Horizontal
Antenna Type:	Directional Antenna (M/N: AP-ANT-28)	Model No.:	APIN0504
Remark:	There is the ambient noise within frequency range 9kHz~30MHz and 18GHz~40GHz, the permissible value is not show in the report.		



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			7443.000	46.960	35.067	-27.040	74.000	11.893	PK
2			7443.544	34.165	22.575	-19.835	54.000	11.590	AV
3			8216.500	47.759	35.488	-26.241	74.000	12.271	PK
4			8216.885	34.663	22.335	-19.337	54.000	12.328	AV
5			10826.000	51.982	34.337	-22.018	74.000	17.645	PK
6		*	10826.354	38.998	21.665	-15.002	54.000	17.333	AV

Note 1: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

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

Note 2: We selected the 2.4GHz and 5GHz worst-case mode of radiated spurious emissions in the DTS and UNII reports.

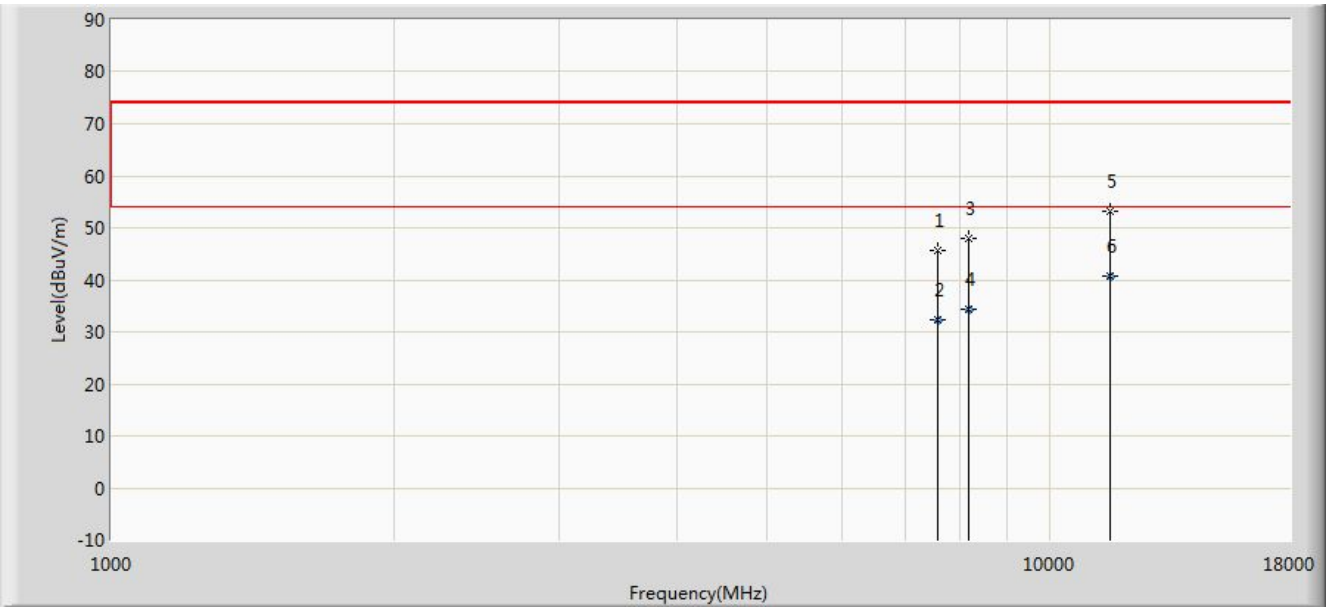
Note 3: 2.4GHz Wi-Fi 802.11n-HT20 Channel 2437MHz Power setting = 80;

5GHz Wi-Fi 802.11ac-VHT20 Channel 5825MHz Power setting = 78;

2.4GHz Bluetooth LE channel 2402MHz Power setting = 8;

Note 4: ZigBee and Bluetooth-LE can’t transmit simultaneously and Bluetooth-LE power higher than ZigBee, so we only assess the WIFI and Bluetooth-LE simultaneous transmission.

Test Mode:	2.4GHz, 5GHz Wi-Fi + BLE Transmit	Test Site:	AC1
Test Engineer:	Kevin	Polarity:	Vertical
Antenna Type:	Directional Antenna (M/N: AP-ANT-28)	Model No.:	APIN0504
Remark:	There is the ambient noise within frequency range 9kHz~30MHz and 18GHz~40GHz, the permissible value is not show in the report.		



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			7596.000	45.584	33.828	-28.416	74.000	11.756	PK
2			7596.545	32.359	20.544	-21.641	54.000	11.814	AV
3			8191.000	48.000	35.509	-26.000	74.000	12.491	PK
4			8191.545	34.432	22.115	-19.568	54.000	12.317	AV
5			11591.000	53.044	35.398	-20.956	74.000	17.646	PK
6		*	11591.554	40.596	22.588	-13.404	54.000	18.008	AV

Note 1: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

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

Note 2: We selected the 2.4GHz and 5GHz worst-case mode of radiated spurious emissions in the DTS and UNII reports.

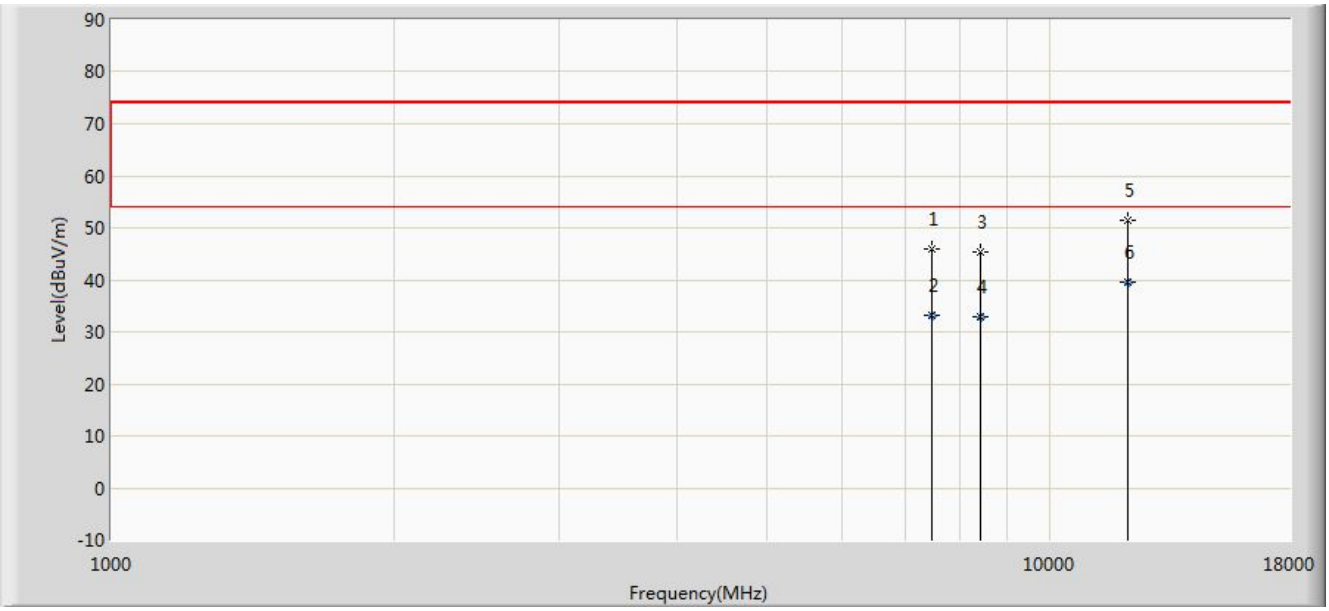
Note 3: 2.4GHz Wi-Fi 802.11n-HT20 Channel 2437MHz Power setting = 80;

5GHz Wi-Fi 802.11ac-VHT20 Channel 5825MHz Power setting = 78;

2.4GHz Bluetooth LE channel 2402MHz Power setting = 8;

Note 4: ZigBee and Bluetooth-LE can’t transmit simultaneously and Bluetooth-LE power higher than ZigBee, so we only assess the WIFI and Bluetooth-LE simultaneous transmission.

Test Mode:	2.4GHz, 5GHz Wi-Fi + BLE Transmit	Test Site:	AC1
Test Engineer:	Kevin	Polarity:	Horizontal
Antenna Type:	Internal Antenna	Model No.:	APIN0505
Remark:	There is the ambient noise within frequency range 9kHz~30MHz and 18GHz~40GHz, the permissible value is not show in the report.		



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			7468.500	46.068	34.231	-27.932	74.000	11.837	PK
2			7468.558	33.209	21.565	-20.791	54.000	11.645	AV
3			8437.500	45.499	33.123	-28.501	74.000	12.376	PK
4			8437.985	32.881	20.454	-21.119	54.000	12.427	AV
5			12101.000	51.421	34.310	-22.579	74.000	17.111	PK
6		*	12101.545	39.662	21.845	-14.338	54.000	17.816	AV

Note 1: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

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

Note 2: We selected the 2.4GHz and 5GHz worst-case mode of radiated spurious emissions in the DTS and UNII reports.

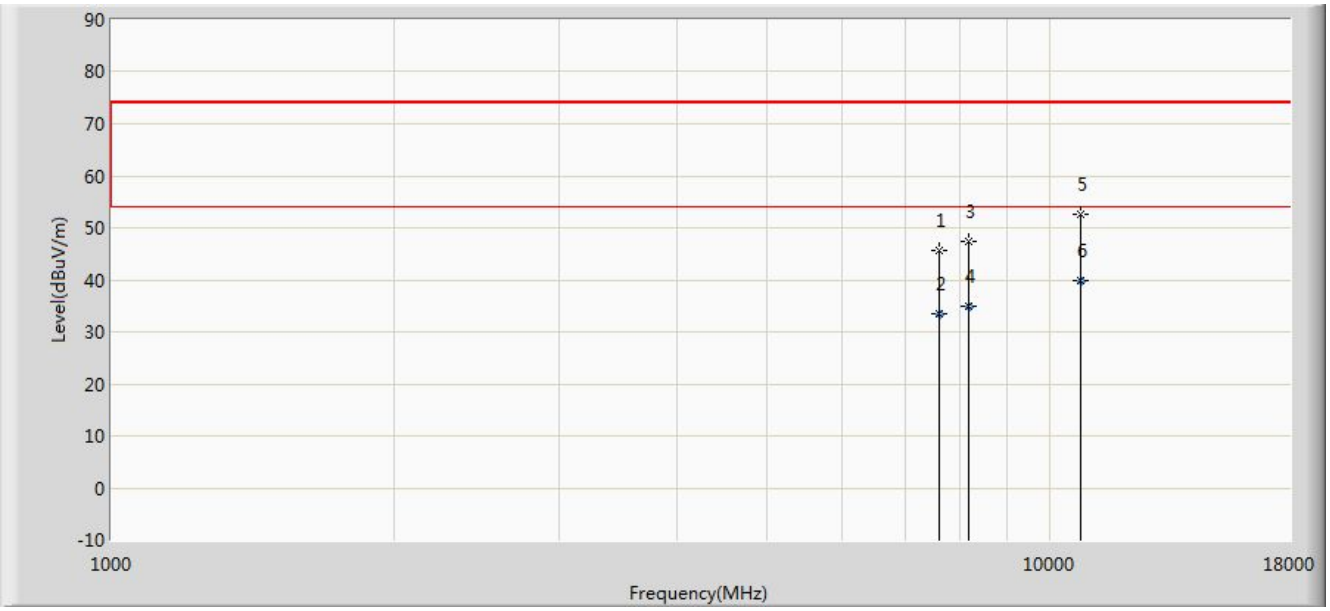
Note 3: 2.4GHz Wi-Fi 802.11b Channel 2412MHz Power setting = 75;

5GHz Wi-Fi 802.11ac-VHT20 Channel 5745MHz Power setting = 78;

2.4GHz Bluetooth LE channel 2402MHz Power setting = 8;

Note 4: ZigBee and Bluetooth-LE can’t transmit simultaneously and Bluetooth-LE power higher than ZigBee, so we only assess the WIFI and Bluetooth-LE simultaneous transmission.

Test Mode:	2.4GHz, 5GHz Wi-Fi + BLE Transmit	Test Site:	AC1
Test Engineer:	Kevin	Polarity:	Vertical
Antenna Type:	Internal Antenna	Model No.:	APIN0505
Remark:	There is the ambient noise within frequency range 9kHz~30MHz and 18GHz~40GHz, the permissible value is not show in the report.		



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			7630.000	45.717	34.029	-28.283	74.000	11.688	PK
2			7630.541	33.394	21.544	-20.606	54.000	11.850	AV
3			8174.000	47.399	35.016	-26.601	74.000	12.383	PK
4			8174.454	34.933	22.625	-19.067	54.000	12.308	AV
5			10783.500	52.596	35.104	-21.404	74.000	17.491	PK
6		*	10783.965	39.818	22.544	-14.182	54.000	17.273	AV

Note 1: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

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

Note 2: We selected the 2.4GHz and 5GHz worst-case mode of radiated spurious emissions in the DTS and UNII reports.

Note 3: 2.4GHz Wi-Fi 802.11b Channel 2412MHz Power setting = 75;

5GHz Wi-Fi 802.11ac-VHT20 Channel 5745MHz Power setting = 78;

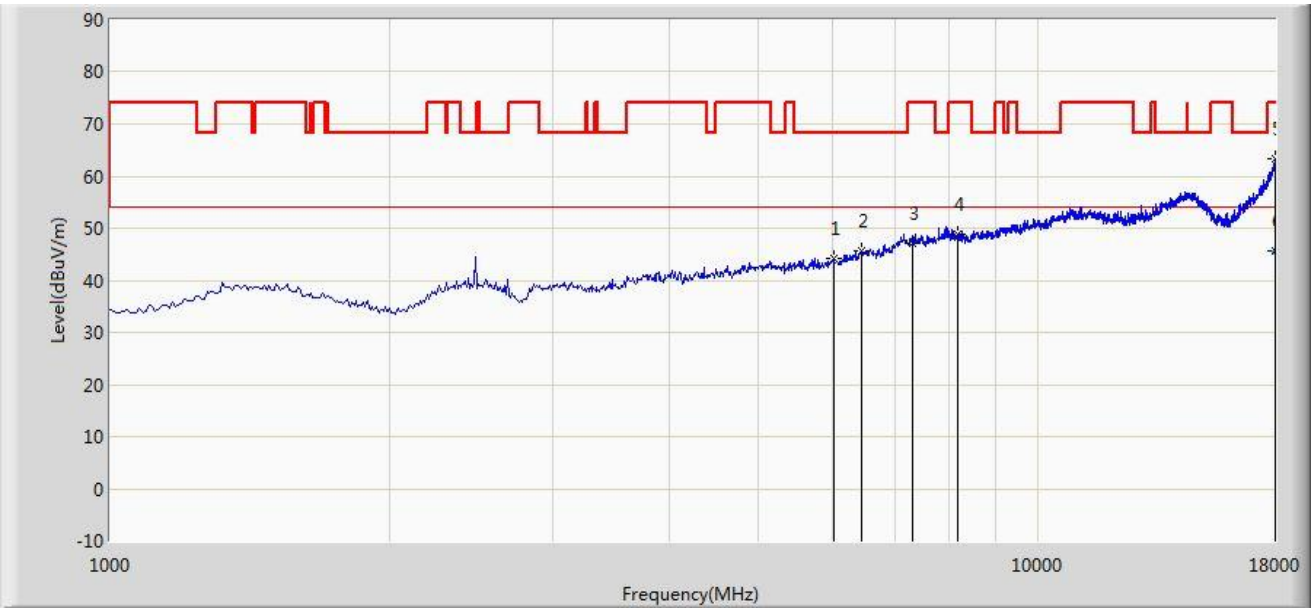
2.4GHz Bluetooth LE channel 2402MHz Power setting = 8;

Note 4: ZigBee and Bluetooth-LE can’t transmit simultaneously and Bluetooth-LE power higher than ZigBee, so we only assess the WIFI and Bluetooth-LE simultaneous transmission.

The End

Appendix A - Worse Case Radiated Spurious Emission Plot

Site: AC1	Time: 2019/06/24 - 23:45
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: BBHA9120D_1GHz_18GHz	Polarity: Horizontal
EUT: ACCESS POINT (APIN0505)	Power: By POE
Test Mode: Transmit by BLE at channel 2480MHz	



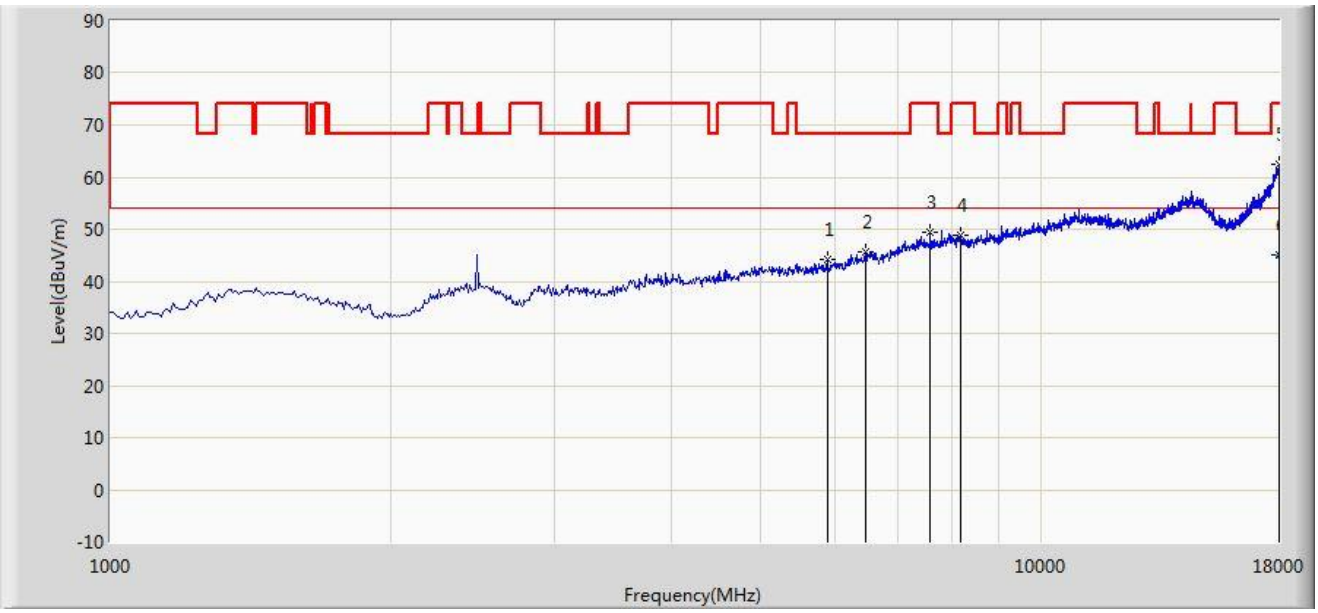
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor	Type
1			6015.000	44.101	36.582	-24.099	68.200	7.519	PK
2			6457.000	45.534	36.320	-22.666	68.200	9.214	PK
3			7332.500	47.212	35.550	-26.788	74.000	11.663	PK
4			8182.500	48.900	36.463	-25.100	74.000	12.436	PK
5			18000.000	63.394	35.070	-10.606	74.000	28.324	PK
6		*	18000.000	45.774	17.450	-8.226	54.000	28.324	AV

Note1: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Note2: The test trace (Frequency range 13GHz ~ 18GHz above average limit) is same as the ambient noise, we selected the highest peak level frequency and performed average emission testing again.

Site: AC1	Time: 2019/06/24 - 23:49
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: BBHA9120D_1GHz_18GHz	Polarity: Vertical
EUT: ACCESS POINT (APIN0505)	Power: By POE
Test Mode: Transmit by BLE at channel 2480MHz	



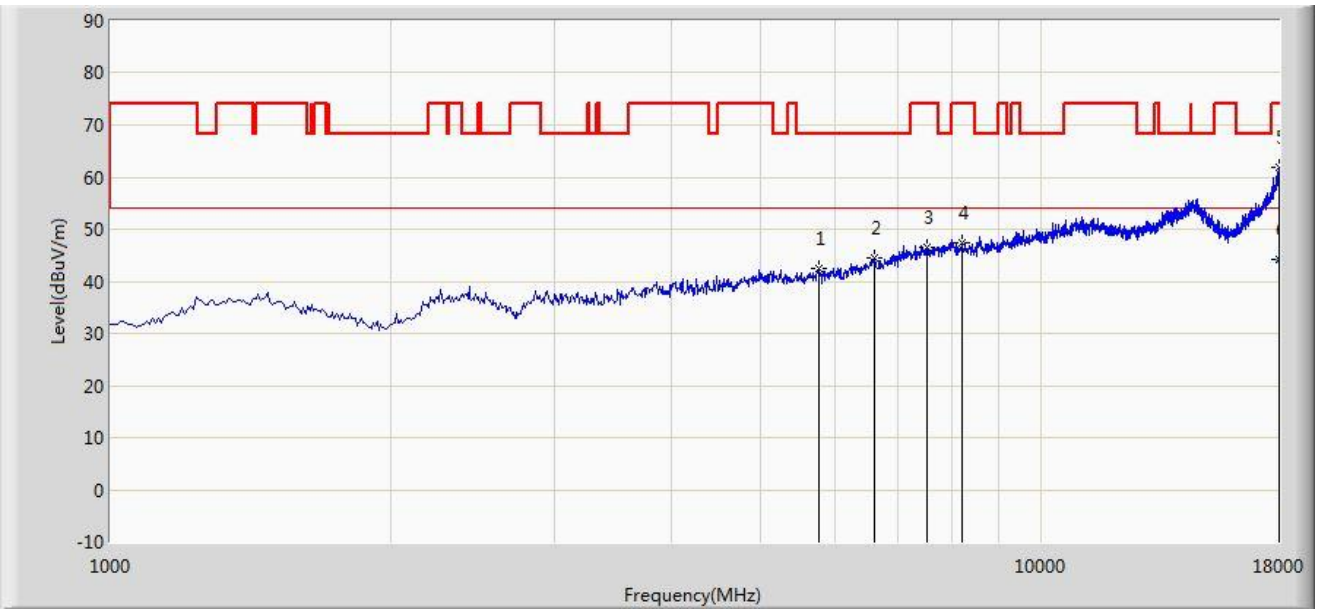
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor	Type
1			5896.000	44.104	36.605	-24.096	68.200	7.499	PK
2			6465.500	45.586	36.272	-22.614	68.200	9.314	PK
3			7596.000	49.382	37.626	-24.618	74.000	11.756	PK
4			8174.000	48.737	36.354	-25.263	74.000	12.383	PK
5			18000.000	62.440	34.116	-11.560	74.000	28.324	PK
6		*	18000.000	45.104	16.780	-8.896	54.000	28.324	AV

Note1: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Note2: The test trace (Frequency range 13GHz ~ 18GHz above average limit) is same as the ambient noise, we selected the highest peak level frequency and performed average emission testing again.

Site: AC1	Time: 2019/07/13 - 23:45
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: BBHA9120D_1GHz_18GHz	Polarity: Horizontal
EUT: ACCESS POINT (APIN0505)	Power: By POE
Test Mode: Transmit by ZigBee at channel 2405MHz	



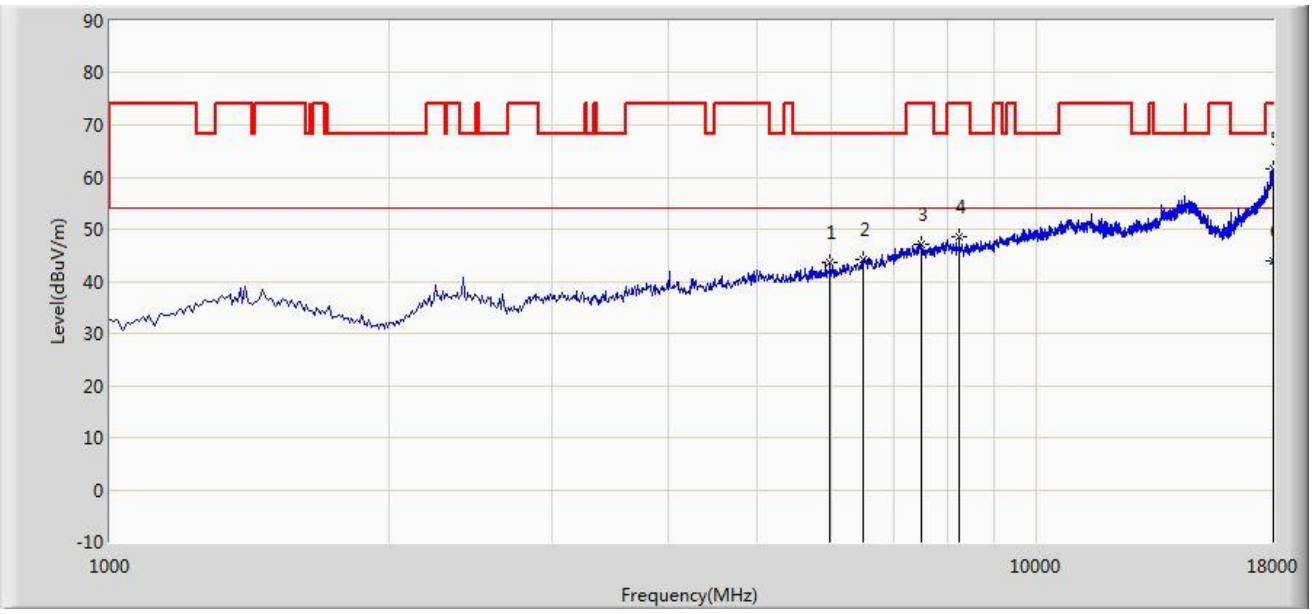
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor	Type
1			5777.000	42.451	35.250	-25.749	68.200	7.201	PK
2			6627.000	44.376	34.860	-23.824	68.200	9.516	PK
3			7536.500	46.411	34.539	-27.589	74.000	11.871	PK
4			8216.500	47.362	35.091	-26.638	74.000	12.271	PK
5			18000.000	61.882	33.558	-12.118	74.000	28.324	PK
6		*	18000.000	44.274	15.950	-9.726	54.000	28.324	AV

Note1: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Note2: The test trace (Frequency range 13GHz ~ 18GHz above average limit) is same as the ambient noise, we selected the highest peak level frequency and performed average emission testing again.

Site: AC1	Time: 2019/07/13 - 23:46
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: BBHA9120D_1GHz_18GHz	Polarity: Vertical
EUT: ACCESS POINT (APIN0505)	Power: By POE
Test Mode: Transmit by ZigBee at channel 2405MHz	



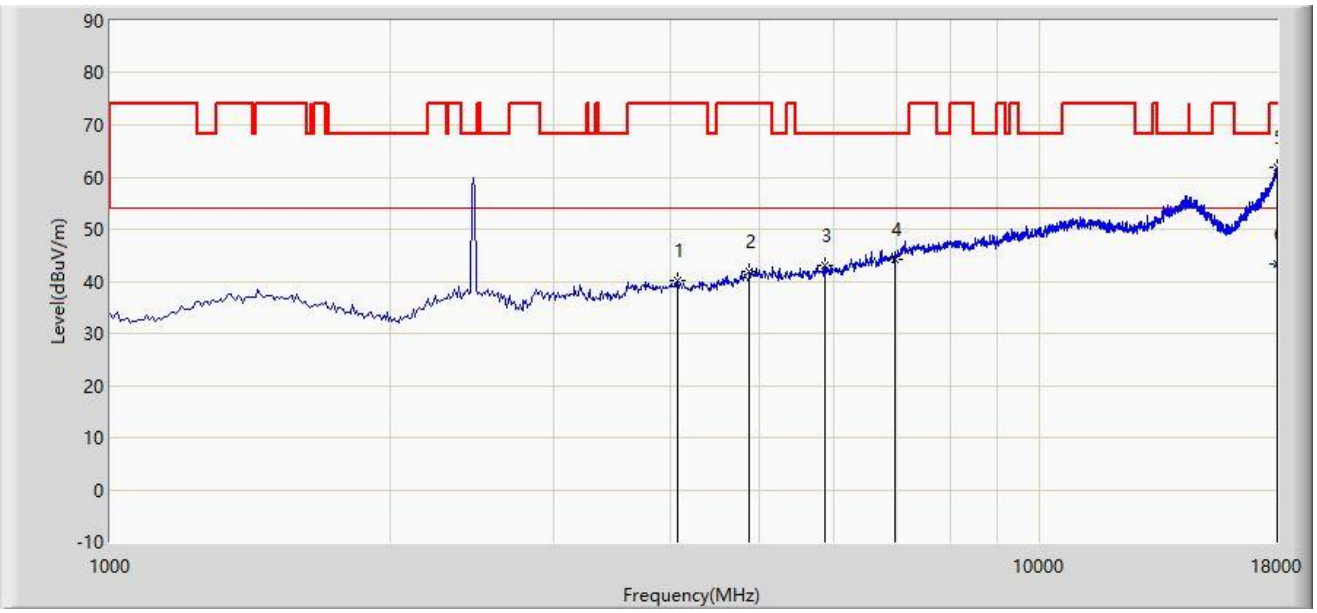
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor	Type
1			5989.500	43.719	36.301	-24.481	68.200	7.418	PK
2			6491.000	44.087	34.782	-24.113	68.200	9.305	PK
3			7511.000	47.095	35.175	-26.905	74.000	11.920	PK
4			8250.500	48.535	36.266	-25.465	74.000	12.270	PK
5			17974.500	61.538	33.416	-12.462	74.000	28.122	PK
6		*	17974.500	43.772	15.650	-10.228	54.000	28.122	AV

Note1: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Note2: The test trace (Frequency range 13GHz ~ 18GHz above average limit) is same as the ambient noise, we selected the highest peak level frequency and performed average emission testing again.

Site: AC1	Time: 2019/06/27 - 04:54
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: BBHA9120D_1GHz_18GHz	Polarity: Horizontal
EUT: ACCESS POINT (APIN0505)	Power: By POE
Test Mode: Transmit by 802.11ax-HE20 at channel 2462MHz Ant 0 + 1	



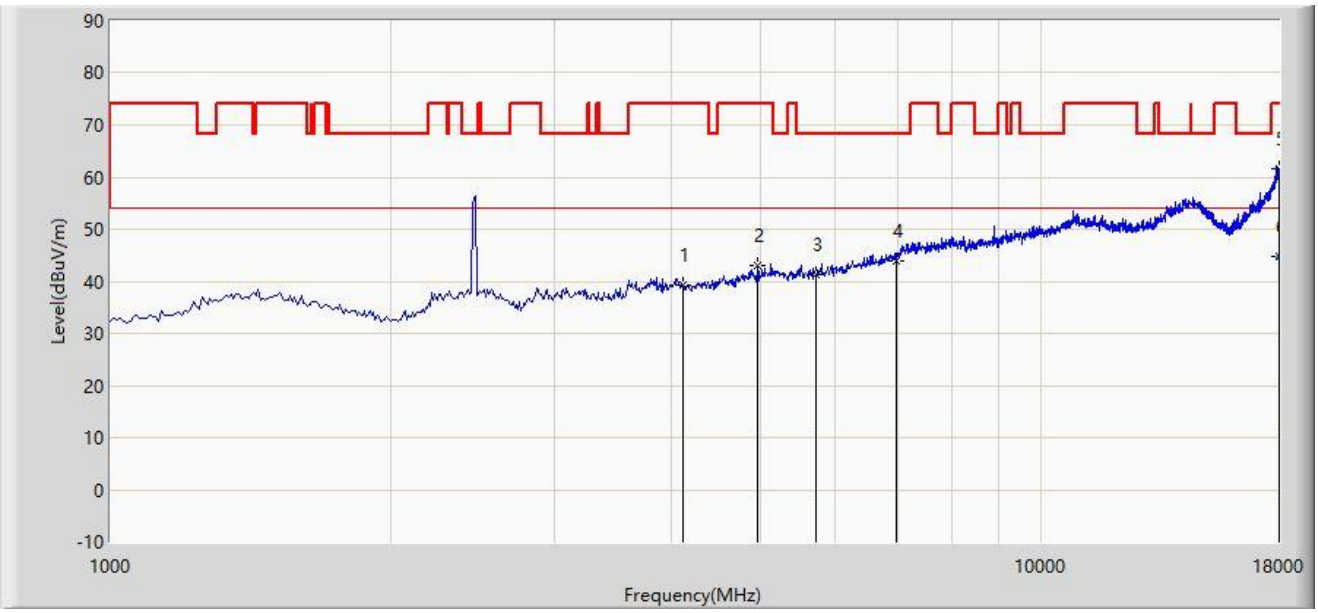
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			4077.000	40.100	25.040	-33.900	74.000	15.060	PK
2			4867.500	41.800	25.529	-32.200	74.000	16.271	PK
3			5879.000	43.100	25.730	-25.100	68.200	17.370	PK
4			6984.000	44.200	24.742	-24.000	68.200	19.458	PK
5			17974.500	61.757	39.904	-12.243	74.000	21.853	PK
6		*	17974.500	43.450	21.597	-10.550	54.000	21.853	AV

Note1: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Note2: The test trace (Frequency range 13GHz ~ 18GHz above average limit) is same as the ambient noise, we selected the highest peak level frequency and performed average emission testing again.

Site: AC1	Time: 2019/06/27 - 04:55
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: BBHA9120D_1GHz_18GHz	Polarity: Vertical
EUT: ACCESS POINT (APIN0505)	Power: By POE
Test Mode: Transmit by 802.11ax-HE20 at channel 2462MHz Ant 0 + 1	



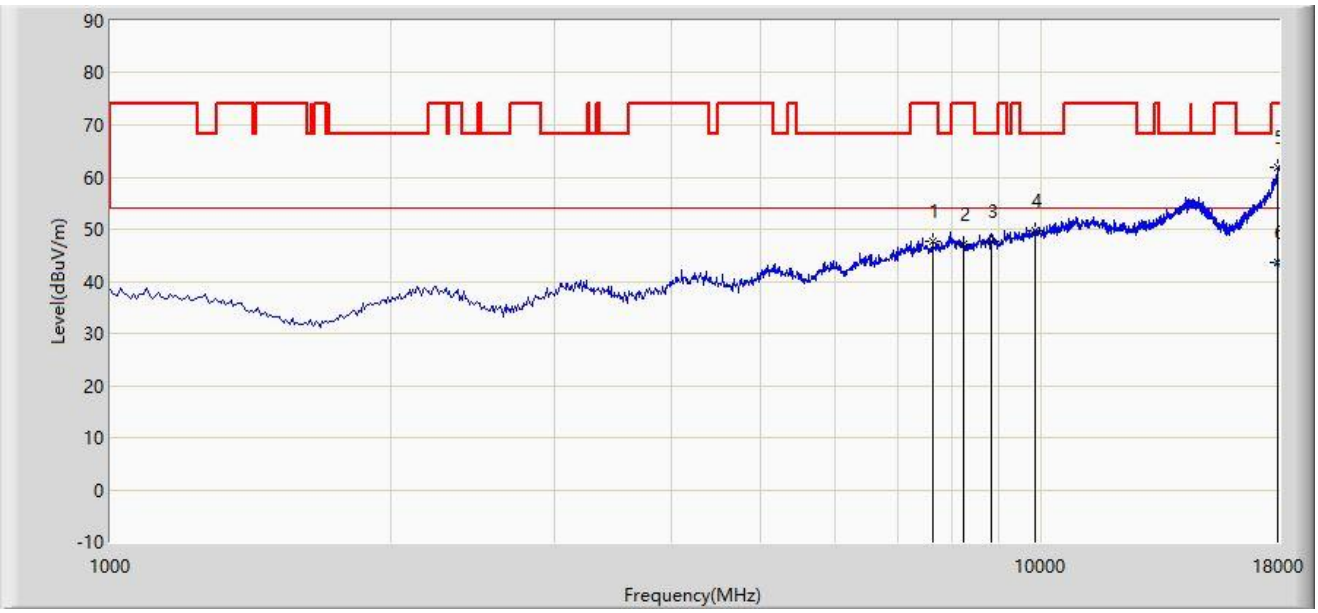
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			4119.500	39.400	38.729	-34.600	74.000	0.671	PK
2			4961.000	43.100	39.628	-30.900	74.000	3.472	PK
3			5734.500	41.300	36.530	-26.900	68.200	4.770	PK
4			6984.000	44.000	33.493	-24.200	68.200	10.507	PK
5			17974.500	61.703	30.295	-12.297	74.000	31.407	PK
6		*	17974.500	44.799	13.391	-9.201	54.000	31.407	AV

Note1: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Note2: The test trace (Frequency range 13GHz ~ 18GHz above average limit) is same as the ambient noise, we selected the highest peak level frequency and performed average emission testing again.

Site: AC1	Time: 2019/06/28 - 03:48
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: BBHA9120D_1GHz_18GHz	Polarity: Horizontal
EUT: ACCESS POINT (APIN0505)	Power: By POE
Test Mode: Transmit by 802.11a at channel 5220MHz Ant 0 + 1	



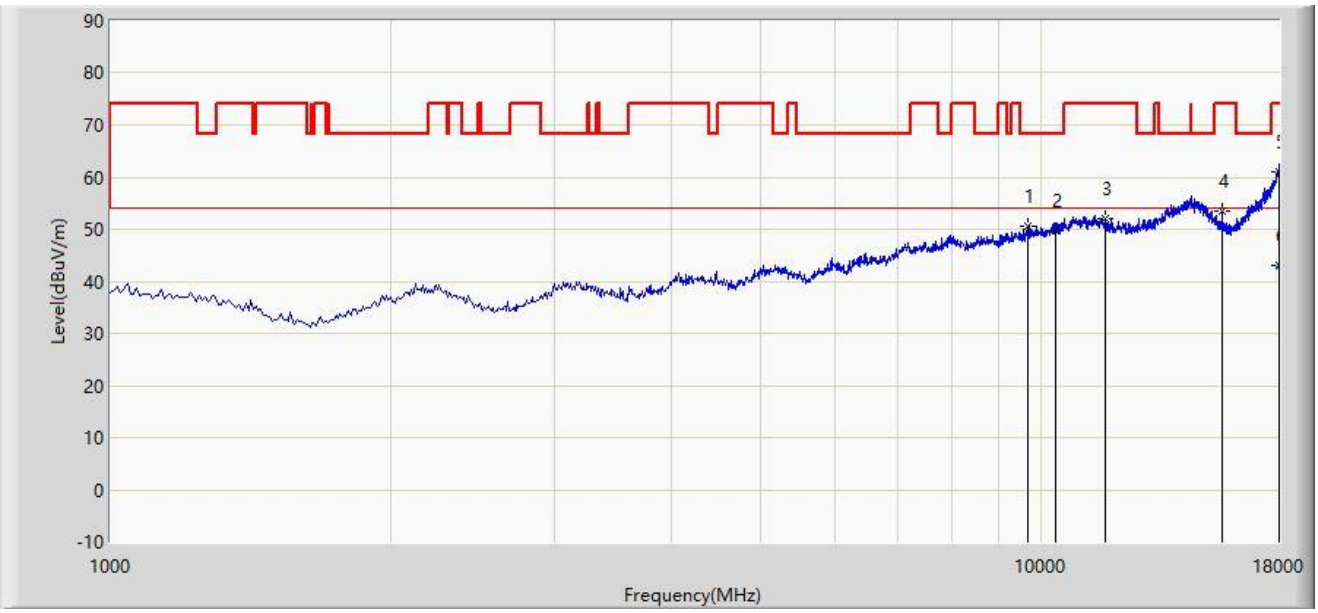
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			7638.500	47.600	35.742	-26.400	74.000	11.859	PK
2			8242.000	47.200	34.861	-26.800	74.000	12.339	PK
3			8820.000	47.600	34.297	-20.600	68.200	13.303	PK
4			9857.000	49.600	34.810	-18.600	68.200	14.790	PK
5			17957.500	61.931	30.565	-12.069	74.000	31.365	PK
6		*	17957.500	43.747	12.381	-10.253	54.000	31.365	AV

Note1: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Note2: The test trace (Frequency range 13GHz ~ 18GHz above average limit) is same as the ambient noise, we selected the highest peak level frequency and performed average emission testing again.

Site: AC1	Time: 2019/06/28 - 03:51
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: BBHA9120D_1GHz_18GHz	Polarity: Vertical
EUT: ACCESS POINT (APIN0505)	Power: By POE
Test Mode: Transmit by 802.11a at channel 5220MHz Ant 0 + 1	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			9661.500	50.500	36.350	-17.700	68.200	14.151	PK
2			10350.000	49.800	33.413	-18.400	68.200	16.387	PK
3			11701.500	52.000	34.043	-22.000	74.000	17.958	PK
4			15622.500	53.600	32.758	-20.400	74.000	20.842	PK
5			17974.500	61.001	29.593	-12.999	74.000	31.407	PK
6		*	17974.500	43.061	11.653	-10.939	54.000	31.407	AV

Note1: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Note2: The test trace (Frequency range 13GHz ~ 18GHz above average limit) is same as the ambient noise, we selected the highest peak level frequency and performed average emission testing again.

Appendix B - Test Setup Photograph

Refer to “1906TW0102-UT” file.

Appendix C - EUT Photograph

Refer to “1906TW0102-UE” file.