

Test Details	
Manufacturer	The Chamberlain Group, Inc.
EUT	Access Control Hub
Model No.	CAPAC
Mode	Wi-Fi – 802.11b
Frequency Tested	2412MHz
Notes	Peak Measurements in the Restricted Bands

Freq. (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Peak Total dBµV/m at 3m	Peak Total µV/m at 3 m	Peak Limit µV/m at 3 m	Margin (dB)
4824.00	H	50.31	Ambient	5.70	36.07	-40.23	51.85	391.13	5000.00	-22.13
4824.00	V	50.89	Ambient	5.70	36.07	-40.23	52.43	418.13	5000.00	-21.55
12060.00	H	49.56	Ambient	8.61	41.59	-39.68	60.09	1009.96	5000.00	-13.89
12060.00	V	49.98	Ambient	8.61	41.59	-39.68	60.51	1060.00	5000.00	-13.47
14472.00	H	49.26	Ambient	9.58	41.82	-40.03	60.62	1074.30	5000.00	-13.36
14472.00	V	49.18	Ambient	9.58	41.82	-40.03	60.54	1064.45	5000.00	-13.44
19296.00	H	29.36	Ambient	2.21	40.38	-27.87	44.09	160.11	5000.00	-29.89
19296.00	V	29.53	Ambient	2.21	40.38	-27.87	44.26	163.27	5000.00	-29.72

Test Details	
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Mode	Wi-Fi – 802.11b
Frequency Tested	2412MHz
Notes	Average Measurements in the Restricted Bands

Freq. (MHz)	Ant Pol	Meter Reading (dBμV)	Ambient	CBL Fac. (dB)	Ant Fac. (dB/m)	Pre Amp (dB)	Duty Cycle (dB)	Ave. Total dBμV/m at 3m	Ave. Total μV/m at 3 m	Ave. Limit μV/m at 3 m	Margin (dB)
4824.00	H	35.94	Ambient	5.70	36.07	-40.23	0.00	37.48	74.79	500.00	-16.50
4824.00	V	35.61	Ambient	5.70	36.07	-40.23	0.00	37.15	72.00	500.00	-16.83
12060.00	H	34.46	Ambient	8.61	41.59	-39.68	0.00	44.99	177.54	500.00	-8.99
12060.00	V	34.51	Ambient	8.61	41.59	-39.68	0.00	45.04	178.57	500.00	-8.94
14472.00	H	34.34	Ambient	9.58	41.82	-40.03	0.00	45.70	192.81	500.00	-8.28
14472.00	V	34.37	Ambient	9.58	41.82	-40.03	0.00	45.73	193.48	500.00	-8.25
19296.00	H	15.22	Ambient	2.21	40.38	-27.87	0.00	29.95	31.44	500.00	-24.03
19296.00	V	15.10	Ambient	2.21	40.38	-27.87	0.00	29.83	31.00	500.00	-24.15

Test Details	
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EUT	Access Control Hub
Model No.	CAPAC
Mode	Wi-Fi – 802.11b
Frequency Tested	2412MHz
Notes	Peak Measurements in Non-Restricted Bands

Freq. (MHz)	Ant Pol	Meter Reading (dB $\mu$ V)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Peak Total dB $\mu$ V/m at 3m	Peak Total $\mu$ V/m at 3 m	Peak Limit $\mu$ V/m at 3 m	Margin (dB)
2412.00	H	68.52		4.29	32.71	0.00	105.52	188853.47		
2412.00	V	66.94		4.29	32.71	0.00	103.94	157443.58		
7236.00	H	39.99	Ambient	6.86	38.34	-40.06	45.13	180.57	18885.35	-40.39
7236.00	V	40.79	Ambient	6.86	38.34	-40.06	45.93	197.99	18885.35	-39.59
9648.00	H	38.86	Ambient	8.21	39.22	-39.58	46.71	216.62	18885.35	-38.81
9648.00	V	38.56	Ambient	8.21	39.22	-39.58	46.41	209.27	18885.35	-39.11
16884.00	H	39.29	Ambient	10.95	44.71	-38.82	56.13	640.11	18885.35	-29.40
16884.00	V	38.81	Ambient	10.95	44.71	-38.82	55.65	605.70	18885.35	-29.88
21708.00	H	20.11	Ambient	2.23	40.56	-28.69	34.22	51.41	18885.35	-51.30
21708.00	V	19.37	Ambient	2.23	40.56	-28.69	33.48	47.21	18885.35	-52.04
24120.00	H	20.07	Ambient	2.24	40.62	-29.36	33.57	47.68	18885.35	-51.96
24120.00	V	19.26	Ambient	2.24	40.62	-29.36	32.76	43.43	18885.35	-52.77

Test Details	
Manufacturer	The Chamberlain Group, Inc.
EUT	Access Control Hub
Model No.	CAPAC
Mode	Wi-Fi – 802.11b
Frequency Tested	2437MHz
Notes	Peak Measurements in the Restricted Bands

Freq. (MHz)	Ant Pol	Meter Reading (dB $\mu$ V)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Peak Total dB $\mu$ V/m at 3m	Peak Total $\mu$ V/m at 3 m	Peak Limit $\mu$ V/m at 3 m	Margin (dB)
4874.00	H	51.17	Ambient	5.73	36.16	-40.25	52.81	437.03	5000.00	-21.17
4874.00	V	50.78	Ambient	5.73	36.16	-40.25	52.42	417.84	5000.00	-21.56
7311.00	H	50.72	Ambient	6.88	38.20	-40.06	55.74	612.43	5000.00	-18.24
7311.00	V	51.39	Ambient	6.88	38.20	-40.06	56.41	661.54	5000.00	-17.57
12185.00	H	49.05	Ambient	8.93	41.66	-39.62	60.01	1001.55	5000.00	-13.97
12185.00	V	49.17	Ambient	8.93	41.66	-39.62	60.13	1015.49	5000.00	-13.85
19496.00	H	29.44	Ambient	2.22	40.39	-27.75	44.30	164.10	5000.00	-29.68
19496.00	V	25.11	Ambient	2.22	40.39	-27.75	39.97	99.68	5000.00	-34.01

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Model No.	CAPAC
Mode	Wi-Fi – 802.11b
Frequency Tested	2437MHz
Notes	Average Measurements in the Restricted Bands

Freq. (MHz)	Ant Pol	Meter Reading (dB $\mu$ V)	Ambient	CBL Fac. (dB)	Ant Fac. (dB/m)	Pre Amp (dB)	Duty Cycle (dB)	Ave. Total dB $\mu$ V/m at 3m	Ave. Total $\mu$ V/m at 3 m	Ave. Limit $\mu$ V/m at 3 m	Margin (dB)
4874.00	H	35.62	Ambient	5.73	36.16	-40.25	0.00	37.26	72.95	500.00	-16.72
4874.00	V	35.59	Ambient	5.73	36.16	-40.25	0.00	37.23	72.70	500.00	-16.75
7311.00	H	35.15	Ambient	6.88	38.20	-40.06	0.00	40.17	101.99	500.00	-13.81
7311.00	V	35.47	Ambient	6.88	38.20	-40.06	0.00	40.49	105.82	500.00	-13.49
12185.00	H	34.18	Ambient	8.93	41.66	-39.62	0.00	45.14	180.79	500.00	-8.84
12185.00	V	34.18	Ambient	8.93	41.66	-39.62	0.00	45.14	180.79	500.00	-8.84
19496.00	H	14.68	Ambient	2.22	40.39	-27.75	0.00	29.54	30.00	500.00	-24.44
19496.00	V	10.80	Ambient	2.22	40.39	-27.75	0.00	25.66	19.19	500.00	-28.32

Test Details	
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Model No.	CAPAC
Mode	Wi-Fi – 802.11b
Frequency Tested	2437MHz
Notes	Peak Measurements in Non-Restricted Bands

Freq. (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Peak Total dBµV/m at 3m	Peak Total µV/m at 3 m	Peak Limit µV/m at 3 m	Margin (dB)
2437.00	H	68.13		4.30	32.86	0.00	105.29	183865.60		
2437.00	V	68.18		4.30	32.86	0.00	105.34	184927.07		
9748.00	H	38.59	Ambient	8.24	39.33	-39.56	46.61	213.95	18492.71	-38.73
9748.00	V	38.50	Ambient	8.24	39.33	-39.56	46.52	211.74	18492.71	-38.82
14622.00	H	38.60	Ambient	9.70	42.04	-40.17	50.16	322.26	18492.71	-35.18
14622.00	V	38.73	Ambient	9.70	42.04	-40.17	50.29	327.12	18492.71	-35.05
17059.00	H	38.63	Ambient	10.96	44.52	-38.77	55.34	584.96	18492.71	-30.00
17059.00	V	38.32	Ambient	10.96	44.52	-38.77	55.03	564.45	18492.71	-30.31
21933.00	H	19.98	Ambient	2.21	40.58	-28.90	33.87	49.35	18492.71	-51.47
21933.00	V	19.58	Ambient	2.21	40.58	-28.90	33.47	47.13	18492.71	-51.87
24370.00	H	20.10	Ambient	2.23	40.63	-29.36	33.60	47.84	18492.71	-51.74
24370.00	V	20.19	Ambient	2.23	40.63	-29.36	33.69	48.34	18492.71	-51.65



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Model No.	CAPAC
Mode	Wi-Fi – 802.11b
Frequency Tested	2462MHz
Notes	Peak Measurements in the Restricted Bands

Freq. (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Peak Total dBµV/m at 3m	Peak Total µV/m at 3 m	Peak Limit µV/m at 3 m	Margin (dB)
4924.00	H	50.27	Ambient	5.77	36.24	-40.27	52.00	398.13	5000.00	-21.98
4924.00	V	50.04	Ambient	5.77	36.24	-40.27	51.77	387.73	5000.00	-22.21
7386.00	H	50.50	Ambient	6.89	38.05	-40.05	55.39	588.19	5000.00	-18.59
7386.00	V	51.59		6.89	38.05	-40.05	56.48	666.83	5000.00	-17.50
12310.00	H	49.75	Ambient	9.30	41.60	-39.57	61.08	1131.76	5000.00	-12.90
12310.00	V	48.86	Ambient	9.30	41.60	-39.57	60.19	1021.54	5000.00	-13.79
19696.00	H	29.89	Ambient	2.23	40.40	-28.04	44.47	167.39	5000.00	-29.50
19696.00	V	30.03	Ambient	2.23	40.40	-28.04	44.61	170.11	5000.00	-29.36
22158.00	H	30.56	Ambient	2.21	40.58	-28.73	44.62	170.31	5000.00	-29.35
22158.00	V	31.57	Ambient	2.21	40.58	-28.73	45.63	191.31	5000.00	-28.34

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Notes	Average Measurements in the Restricted Bands

Freq. (MHz)	Ant Pol	Meter Reading (dBμV)	Ambient	CBL Fac. (dB)	Ant Fac. (dB/m)	Pre Amp (dB)	Duty Cycle (dB)	Ave. Total dBμV/m at 3m	Ave. Total μV/m at 3 m	Ave. Limit μV/m at 3 m	Margin (dB)
4924.00	H	35.83	Ambient	5.77	36.24	-40.27	0.00	37.56	75.51	500.00	-16.42
4924.00	V	35.86	Ambient	5.77	36.24	-40.27	0.00	37.59	75.78	500.00	-16.39
7386.00	H	34.89	Ambient	6.89	38.05	-40.05	0.00	39.78	97.50	500.00	-14.20
7386.00	V	36.25		6.89	38.05	-40.05	0.00	41.14	114.03	500.00	-12.84
12310.00	H	33.89	Ambient	9.30	41.60	-39.57	0.00	45.22	182.29	500.00	-8.76
12310.00	V	33.87	Ambient	9.30	41.60	-39.57	0.00	45.20	181.87	500.00	-8.78
19696.00	H	15.14	Ambient	2.23	40.40	-28.04	0.00	29.72	30.64	500.00	-24.25
19696.00	V	15.18	Ambient	2.23	40.40	-28.04	0.00	29.76	30.78	500.00	-24.21
22158.00	H	16.15	Ambient	2.21	40.58	-28.73	0.00	30.21	32.41	500.00	-23.76
22158.00	V	16.11	Ambient	2.21	40.58	-28.73	0.00	30.17	32.26	500.00	-23.80

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Model No.	CAPAC
Mode	Wi-Fi – 802.11b
Frequency Tested	2462MHz
Notes	Peak Measurements in Non-Restricted Bands

Freq. (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Peak Total dBµV/m at 3m	Peak Total µV/m at 3 m	Peak Limit µV/m at 3 m	Margin (dB)
2462.00	H	67.32		4.32	32.99	0.00	104.63	170375.63		
2462.00	V	66.68		4.32	32.99	0.00	103.99	158273.24		
9848.00	H	39.93	Ambient	8.27	39.34	-39.53	48.00	251.25	17037.56	-36.63
9848.00	V	40.95		8.27	39.34	-39.53	49.02	282.55	17037.56	-35.61
14772.00	H	38.55	Ambient	9.79	42.23	-40.30	50.27	326.32	17037.56	-34.36
14772.00	V	39.01	Ambient	9.79	42.23	-40.30	50.73	344.06	17037.56	-33.90
17234.00	H	39.09	Ambient	11.02	44.13	-38.96	55.28	580.66	17037.56	-29.35
17234.00	V	38.30	Ambient	11.02	44.13	-38.96	54.49	530.18	17037.56	-30.14
24620.00	H	21.11	Ambient	2.22	40.64	-29.01	34.95	55.94	17037.56	-49.67
24620.00	V	21.17	Ambient	2.22	40.64	-29.01	35.01	56.33	17037.56	-49.61

Test Details	
Manufacturer	The Chamberlain Group, Inc.
EUT	Access Control Hub
Model No.	CAPAC
Mode	Wi-Fi – 802.11g
Frequency Tested	2412MHz
Notes	Peak Measurements in the Restricted Bands

Freq. (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Peak Total dBµV/m at 3m	Peak Total µV/m at 3 m	Peak Limit µV/m at 3 m	Margin (dB)
4824.00	H	50.32	Ambient	5.70	36.07	-40.23	51.86	391.58	5000.00	-22.12
4824.00	V	50.64	Ambient	5.70	36.07	-40.23	52.18	406.27	5000.00	-21.80
12060.00	H	50.03	Ambient	8.61	41.59	-39.68	60.56	1066.12	5000.00	-13.42
12060.00	V	49.24	Ambient	8.61	41.59	-39.68	59.77	973.43	5000.00	-14.21
14472.00	H	49.60	Ambient	9.58	41.82	-40.03	60.96	1117.18	5000.00	-13.02
14472.00	V	49.48	Ambient	9.58	41.82	-40.03	60.84	1101.86	5000.00	-13.14
19296.00	H	30.40	Ambient	2.21	40.38	-27.87	45.13	180.48	5000.00	-28.85
19296.00	V	29.94	Ambient	2.21	40.38	-27.87	44.67	171.17	5000.00	-29.31

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Model No.	CAPAC
Mode	Wi-Fi – 802.11g
Frequency Tested	2412MHz
Notes	Average Measurements in the Restricted Bands

Freq. (MHz)	Ant Pol	Meter Reading (dBμV)	Ambient	CBL Fac. (dB)	Ant Fac. (dB/m)	Pre Amp (dB)	Duty Cycle (dB)	Ave. Total dBμV/m at 3m	Ave. Total μV/m at 3 m	Ave. Limit μV/m at 3 m	Margin (dB)
4824.00	H	35.84	Ambient	5.70	36.07	-40.23	0.00	37.38	73.93	500.00	-16.60
4824.00	V	35.85	Ambient	5.70	36.07	-40.23	0.00	37.39	74.01	500.00	-16.59
12060.00	H	34.44	Ambient	8.61	41.59	-39.68	0.00	44.97	177.14	500.00	-9.01
12060.00	V	34.49	Ambient	8.61	41.59	-39.68	0.00	45.02	178.16	500.00	-8.96
14472.00	H	34.20	Ambient	9.58	41.82	-40.03	0.00	45.56	189.73	500.00	-8.42
14472.00	V	34.21	Ambient	9.58	41.82	-40.03	0.00	45.57	189.94	500.00	-8.41
19296.00	H	15.42	Ambient	2.21	40.38	-27.87	0.00	30.15	32.17	500.00	-23.83
19296.00	V	15.43	Ambient	2.21	40.38	-27.87	0.00	30.16	32.20	500.00	-23.82

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Model No.	CAPAC
Mode	Wi-Fi – 802.11g
Frequency Tested	2412MHz
Notes	Peak Measurements in Non-Restricted Bands

Freq. (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Peak Total dBµV/m at 3m	Peak Total µV/m at 3 m	Peak Limit µV/m at 3 m	Margin (dB)
2412.00	H	62.69		4.29	32.71	0.00	99.69	96521.70		
2412.00	V	62.27		4.29	32.71	0.00	99.27	91965.50		
7236.00	H	39.52	Ambient	6.86	38.34	-40.06	44.66	171.06	9652.17	-35.03
7236.00	V	40.49	Ambient	6.86	38.34	-40.06	45.63	191.27	9652.17	-34.06
9648.00	H	38.51	Ambient	8.21	39.22	-39.58	46.36	208.07	9652.17	-33.33
9648.00	V	39.13	Ambient	8.21	39.22	-39.58	46.98	223.46	9652.17	-32.71
16884.00	H	39.34	Ambient	10.95	44.71	-38.82	56.18	643.81	9652.17	-23.52
16884.00	V	39.05	Ambient	10.95	44.71	-38.82	55.89	622.67	9652.17	-23.81
21708.00	H	20.18	Ambient	2.23	40.56	-28.69	34.29	51.83	9652.17	-45.40
21708.00	V	20.65	Ambient	2.23	40.56	-28.69	34.76	54.71	9652.17	-44.93
24120.00	H	19.03	Ambient	2.24	40.62	-29.36	32.53	42.30	9652.17	-47.17
24120.00	V	19.51	Ambient	2.24	40.62	-29.36	33.01	44.70	9652.17	-46.69

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Frequency Tested	2437MHz
Notes	Peak Measurements in the Restricted Bands

Freq. (MHz)	Ant Pol	Meter Reading (dB $\mu$ V)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Peak Total dB $\mu$ V/m at 3m	Peak Total $\mu$ V/m at 3 m	Peak Limit $\mu$ V/m at 3 m	Margin (dB)
4874.00	H	50.72	Ambient	5.73	36.16	-40.25	52.36	414.96	5000.00	-21.62
4874.00	V	50.60	Ambient	5.73	36.16	-40.25	52.24	409.27	5000.00	-21.74
7311.00	H	50.62	Ambient	6.88	38.20	-40.06	55.64	605.42	5000.00	-18.34
7311.00	V	51.20		6.88	38.20	-40.06	56.22	647.23	5000.00	-17.76
12185.00	H	48.81	Ambient	8.93	41.66	-39.62	59.77	974.26	5000.00	-14.21
12185.00	V	49.19	Ambient	8.93	41.66	-39.62	60.15	1017.83	5000.00	-13.83
19496.00	H	29.34	Ambient	2.22	40.39	-27.75	44.20	162.23	5000.00	-29.78
19496.00	V	29.70	Ambient	2.22	40.39	-27.75	44.56	169.09	5000.00	-29.42

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Notes	Average Measurements in the Restricted Bands

Freq. (MHz)	Ant Pol	Meter Reading (dBμV)	Ambient	CBL Fac. (dB)	Ant Fac. (dB/m)	Pre Amp (dB)	Duty Cycle (dB)	Ave. Total dBμV/m at 3m	Ave. Total μV/m at 3 m	Ave. Limit μV/m at 3 m	Margin (dB)
4874.00	H	35.70	Ambient	5.73	36.16	-40.25	0.00	37.34	73.62	500.00	-16.64
4874.00	V	35.86	Ambient	5.73	36.16	-40.25	0.00	37.50	74.99	500.00	-16.48
7311.00	H	35.15	Ambient	6.88	38.20	-40.06	0.00	40.17	101.99	500.00	-13.81
7311.00	V	35.86		6.88	38.20	-40.06	0.00	40.88	110.68	500.00	-13.10
12185.00	H	33.81	Ambient	8.93	41.66	-39.62	0.00	44.77	173.25	500.00	-9.21
12185.00	V	33.98	Ambient	8.93	41.66	-39.62	0.00	44.94	176.67	500.00	-9.04
19496.00	H	14.76	Ambient	2.22	40.39	-27.75	0.00	29.63	30.29	500.00	-24.35
19496.00	V	14.72	Ambient	2.22	40.39	-27.75	0.00	29.58	30.14	500.00	-24.40



Test Details	
Manufacturer	The Chamberlain Group, Inc.
EUT	Access Control Hub
Model No.	CAPAC
Mode	Wi-Fi – 802.11g
Frequency Tested	2437MHz
Notes	Peak Measurements in Non-Restricted Bands

Freq. (MHz)	Ant Pol	Meter Reading (dB $\mu$ V)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Peak Total dB $\mu$ V/m at 3m	Peak Total $\mu$ V/m at 3 m	Peak Limit $\mu$ V/m at 3 m	Margin (dB)
2437.00	H	64.41		4.30	32.86	0.00	101.57	119812.05		
2437.00	V	62.22		4.30	32.86	0.00	99.38	93110.89		
9748.00	H	38.58	Ambient	8.24	39.33	-39.56	46.60	213.70	11981.20	-34.97
9748.00	V	39.26		8.24	39.33	-39.56	47.28	231.10	11981.20	-34.29
14622.00	H	38.91	Ambient	9.70	42.04	-40.17	50.47	333.97	11981.20	-31.10
14622.00	V	38.92	Ambient	9.70	42.04	-40.17	50.48	334.35	11981.20	-31.09
17059.00	H	38.85	Ambient	10.96	44.52	-38.77	55.56	599.97	11981.20	-26.01
17059.00	V	38.79	Ambient	10.96	44.52	-38.77	55.50	595.84	11981.20	-26.07
21933.00	H	19.67	Ambient	2.21	40.58	-28.90	33.56	47.62	11981.20	-48.01
21933.00	V	19.40	Ambient	2.21	40.58	-28.90	33.29	46.16	11981.20	-48.28
24370.00	H	20.72	Ambient	2.23	40.63	-29.36	34.22	51.38	11981.20	-47.35
24370.00	V	20.63	Ambient	2.23	40.63	-29.36	34.13	50.85	11981.20	-47.44

Test Details	
Manufacturer	The Chamberlain Group, Inc.
EUT	Access Control Hub
Model No.	CAPAC
Mode	Wi-Fi – 802.11g
Frequency Tested	2462MHz
Notes	Peak Measurements in the Restricted Bands

Freq. (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Peak Total dBµV/m at 3m	Peak Total µV/m at 3 m	Peak Limit µV/m at 3 m	Margin (dB)
4924.00	H	51.01	Ambient	5.77	36.24	-40.27	52.74	433.54	5000.00	-21.24
4924.00	V	51.03	Ambient	5.77	36.24	-40.27	52.76	434.54	5000.00	-21.22
7386.00	H	50.78	Ambient	6.89	38.05	-40.05	55.67	607.46	5000.00	-18.31
7386.00	V	52.00		6.89	38.05	-40.05	56.89	699.07	5000.00	-17.09
12310.00	H	49.23	Ambient	9.30	41.60	-39.57	60.56	1066.00	5000.00	-13.42
12310.00	V	49.04	Ambient	9.30	41.60	-39.57	60.37	1042.93	5000.00	-13.61
19696.00	H	30.10	Ambient	2.23	40.40	-28.04	44.68	171.48	5000.00	-29.29
19696.00	V	30.06	Ambient	2.23	40.40	-28.04	44.64	170.70	5000.00	-29.33
22158.00	H	31.04	Ambient	2.21	40.58	-28.73	45.10	179.98	5000.00	-28.87
22158.00	V	30.69	Ambient	2.21	40.58	-28.73	44.75	172.87	5000.00	-29.22

Test Details	
Manufacturer	The Chamberlain Group, Inc.
EUT	Access Control Hub
Model No.	CAPAC
Mode	Wi-Fi – 802.11g
Frequency Tested	2462MHz
Notes	Average Measurements in the Restricted Bands

Freq. (MHz)	Ant Pol	Meter Reading (dB $\mu$ V)	Ambient	CBL Fac. (dB)	Ant Fac. (dB/m)	Pre Amp (dB)	Duty Cycle (dB)	Ave. Total dB $\mu$ V/m at 3m	Ave. Total $\mu$ V/m at 3 m	Ave. Limit $\mu$ V/m at 3 m	Margin (dB)
4924.00	H	36.01	Ambient	5.77	36.24	-40.27	0.00	37.74	77.10	500.00	-16.24
4924.00	V	36.00	Ambient	5.77	36.24	-40.27	0.00	37.73	77.01	500.00	-16.25
7386.00	H	35.85	Ambient	6.89	38.05	-40.05	0.00	40.74	108.90	500.00	-13.24
7386.00	V	36.34		6.89	38.05	-40.05	0.00	41.23	115.22	500.00	-12.75
12310.00	H	34.27	Ambient	9.30	41.60	-39.57	0.00	45.60	190.44	500.00	-8.38
12310.00	V	34.31	Ambient	9.30	41.60	-39.57	0.00	45.64	191.32	500.00	-8.34
19696.00	H	15.21	Ambient	2.23	40.40	-28.04	0.00	29.79	30.88	500.00	-24.18
19696.00	V	15.23	Ambient	2.23	40.40	-28.04	0.00	29.81	30.95	500.00	-24.16
22158.00	H	16.21	Ambient	2.21	40.58	-28.73	0.00	30.27	32.64	500.00	-23.70
22158.00	V	16.20	Ambient	2.21	40.58	-28.73	0.00	30.26	32.60	500.00	-23.71

Test Details	
Manufacturer	The Chamberlain Group, Inc.
EUT	Access Control Hub
Model No.	CAPAC
Mode	Wi-Fi – 802.11g
Frequency Tested	2462MHz
Notes	Peak Measurements in Non-Restricted Bands

Freq. (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Peak Total dBµV/m at 3m	Peak Total µV/m at 3 m	Peak Limit µV/m at 3 m	Margin (dB)
2462.00	H	66.03		4.32	32.99	0.00	103.34	146861.34		
2462.00	V	63.23		4.32	32.99	0.00	100.54	106391.63		
9848.00	H	38.77	Ambient	8.27	39.34	-39.53	46.84	219.84	14686.13	-36.50
9848.00	V	38.78	Ambient	8.27	39.34	-39.53	46.85	220.09	14686.13	-36.49
14772.00	H	38.27	Ambient	9.79	42.23	-40.30	49.99	315.96	14686.13	-33.35
14772.00	V	38.19	Ambient	9.79	42.23	-40.30	49.91	313.07	14686.13	-33.43
17234.00	H	38.57	Ambient	11.02	44.13	-38.96	54.76	546.92	14686.13	-28.58
17234.00	V	39.18	Ambient	11.02	44.13	-38.96	55.37	586.71	14686.13	-27.97
24620.00	H	21.41	Ambient	2.22	40.64	-29.01	35.25	57.91	14686.13	-48.08
24620.00	V	21.35	Ambient	2.22	40.64	-29.01	35.19	57.51	14686.13	-48.14

Test Details	
Manufacturer	The Chamberlain Group, Inc.
EUT	Access Control Hub
Model No.	CAPAC
Mode	Wi-Fi – 802.11n
Frequency Tested	2412MHz
Notes	Peak Measurements in the Restricted Bands

Freq. (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Peak Total dBµV/m at 3m	Peak Total µV/m at 3 m	Peak Limit µV/m at 3 m	Margin (dB)
4824.00	H	51.13	Ambient	5.70	36.07	-40.23	52.67	429.85	5000.00	-21.31
4824.00	V	50.73	Ambient	5.70	36.07	-40.23	52.27	410.50	5000.00	-21.71
12060.00	H	48.66	Ambient	8.61	41.59	-39.68	59.19	910.55	5000.00	-14.79
12060.00	V	49.07	Ambient	8.61	41.59	-39.68	59.60	954.57	5000.00	-14.38
14472.00	H	49.47	Ambient	9.58	41.82	-40.03	60.83	1100.59	5000.00	-13.15
14472.00	V	49.35	Ambient	9.58	41.82	-40.03	60.71	1085.49	5000.00	-13.27
19296.00	H	30.06	Ambient	2.21	40.38	-27.87	44.79	173.55	5000.00	-29.19
19296.00	V	30.52	Ambient	2.21	40.38	-27.87	45.25	182.99	5000.00	-28.73

Test Details	
Manufacturer	The Chamberlain Group, Inc.
EUT	Access Control Hub
Model No.	CAPAC
Mode	Wi-Fi – 802.11n
Frequency Tested	2412MHz
Notes	Average Measurements in the Restricted Bands

Freq. (MHz)	Ant Pol	Meter Reading (dBμV)	Ambient	CBL Fac. (dB)	Ant Fac. (dB/m)	Pre Amp (dB)	Duty Cycle (dB)	Ave. Total dBμV/m at 3m	Ave. Total μV/m at 3 m	Ave. Limit μV/m at 3 m	Margin (dB)
4824.00	H	36.04	Ambient	5.70	36.07	-40.23	0.00	37.58	75.65	500.00	-16.40
4824.00	V	36.08	Ambient	5.70	36.07	-40.23	0.00	37.62	76.00	500.00	-16.36
12060.00	H	34.66	Ambient	8.61	41.59	-39.68	0.00	45.19	181.68	500.00	-8.79
12060.00	V	34.75	Ambient	8.61	41.59	-39.68	0.00	45.28	183.57	500.00	-8.70
14472.00	H	34.45	Ambient	9.58	41.82	-40.03	0.00	45.81	195.27	500.00	-8.17
14472.00	V	34.49	Ambient	9.58	41.82	-40.03	0.00	45.85	196.17	500.00	-8.13
19296.00	H	15.48	Ambient	2.21	40.38	-27.87	0.00	30.21	32.39	500.00	-23.77
19296.00	V	15.34	Ambient	2.21	40.38	-27.87	0.00	30.07	31.87	500.00	-23.91

Test Details	
Manufacturer	The Chamberlain Group, Inc.
EUT	Access Control Hub
Model No.	CAPAC
Mode	Wi-Fi – 802.11n
Frequency Tested	2412MHz
Notes	Peak Measurements in Non-Restricted Bands

Freq. (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Peak Total dBµV/m at 3m	Peak Total µV/m at 3 m	Peak Limit µV/m at 3 m	Margin (dB)
2412.00	H	61.52		4.29	32.71	0.00	98.52	84357.74		
2412.00	V	61.07		4.29	32.71	0.00	98.07	80098.61		
7236.00	H	40.08	Ambient	6.86	38.34	-40.06	45.22	182.45	8435.77	-33.30
7236.00	V	40.21	Ambient	6.86	38.34	-40.06	45.35	185.20	8435.77	-33.17
9648.00	H	38.08	Ambient	8.21	39.22	-39.58	45.93	198.02	8435.77	-32.59
9648.00	V	38.17	Ambient	8.21	39.22	-39.58	46.02	200.08	8435.77	-32.50
16884.00	H	38.84	Ambient	10.95	44.71	-38.82	55.68	607.79	8435.77	-22.85
16884.00	V	39.65	Ambient	10.95	44.71	-38.82	56.49	667.20	8435.77	-22.04
21708.00	H	19.58	Ambient	2.23	40.56	-28.69	33.69	48.37	8435.77	-44.83
21708.00	V	19.79	Ambient	2.23	40.56	-28.69	33.90	49.55	8435.77	-44.62
24120.00	H	19.22	Ambient	2.24	40.62	-29.36	32.72	43.23	8435.77	-45.81
24120.00	V	19.49	Ambient	2.24	40.62	-29.36	32.99	44.60	8435.77	-45.54

Test Details	
Manufacturer	The Chamberlain Group, Inc.
EUT	Access Control Hub
Model No.	CAPAC
Mode	Wi-Fi – 802.11n
Frequency Tested	2437MHz
Notes	Peak Measurements in the Restricted Bands

Freq. (MHz)	Ant Pol	Meter Reading (dBμV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Peak Total dBμV/m at 3m	Peak Total μV/m at 3 m	Peak Limit μV/m at 3 m	Margin (dB)
4874.00	H	50.34	Ambient	5.73	36.16	-40.25	51.98	397.20	5000.00	-22.00
4874.00	V	50.22	Ambient	5.73	36.16	-40.25	51.86	391.75	5000.00	-22.12
7311.00	H	49.55	Ambient	6.88	38.20	-40.06	54.57	535.25	5000.00	-19.41
7311.00	V	51.29		6.88	38.20	-40.06	56.31	653.97	5000.00	-17.67
12185.00	H	47.71	Ambient	8.93	41.66	-39.62	58.67	858.37	5000.00	-15.31
12185.00	V	48.25	Ambient	8.93	41.66	-39.62	59.21	913.43	5000.00	-14.77
19496.00	H	29.35	Ambient	2.22	40.39	-27.75	44.21	162.41	5000.00	-29.77
19496.00	V	29.47	Ambient	2.22	40.39	-27.75	44.33	164.67	5000.00	-29.65



Test Details	
Manufacturer	The Chamberlain Group, Inc.
EUT	Access Control Hub
Model No.	CAPAC
Mode	Wi-Fi – 802.11n
Frequency Tested	2437MHz
Notes	Average Measurements in the Restricted Bands

Freq. (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	CBL Fac. (dB)	Ant Fac. (dB/m)	Pre Amp (dB)	Duty Cycle (dB)	Ave. Total dBµV/m at 3m	Ave. Total µV/m at 3 m	Ave. Limit µV/m at 3 m	Margin (dB)
4874.00	H	35.98	Ambient	5.73	36.16	-40.25	0.00	37.62	76.03	500.00	-16.36
4874.00	V	35.96	Ambient	5.73	36.16	-40.25	0.00	37.60	75.86	500.00	-16.38
7311.00	H	35.32	Ambient	6.88	38.20	-40.06	0.00	40.34	104.01	500.00	-13.64
7311.00	V	35.77		6.88	38.20	-40.06	0.00	40.79	109.54	500.00	-13.19
12185.00	H	33.91	Ambient	8.93	41.66	-39.62	0.00	44.87	175.26	500.00	-9.11
12185.00	V	34.06	Ambient	8.93	41.66	-39.62	0.00	45.02	178.31	500.00	-8.96
19496.00	H	14.73	Ambient	2.22	40.39	-27.75	0.00	29.59	30.17	500.00	-24.39
19496.00	V	14.76	Ambient	2.22	40.39	-27.75	0.00	29.62	30.28	500.00	-24.36

Test Details	
Manufacturer	The Chamberlain Group, Inc.
EUT	Access Control Hub
Model No.	CAPAC
Mode	Wi-Fi – 802.11n
Frequency Tested	2437MHz
Notes	Peak Measurements in Non-Restricted Bands

Freq. (MHz)	Ant Pol	Meter Reading (dB $\mu$ V)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Peak Total dB $\mu$ V/m at 3m	Peak Total $\mu$ V/m at 3 m	Peak Limit $\mu$ V/m at 3 m	Margin (dB)
2437.00	H	62.97		4.30	32.86	0.00	100.13	101508.05		
2437.00	V	61.78		4.30	32.86	0.00	98.94	88511.66		
9748.00	H	38.28	Ambient	8.24	39.33	-39.56	46.30	206.44	10150.80	-33.83
9748.00	V	38.05	Ambient	8.24	39.33	-39.56	46.07	201.05	10150.80	-34.06
14622.00	H	38.89	Ambient	9.70	42.04	-40.17	50.45	333.20	10150.80	-29.68
14622.00	V	38.57	Ambient	9.70	42.04	-40.17	50.13	321.15	10150.80	-30.00
17059.00	H	40.08	Ambient	10.96	44.52	-38.77	56.79	691.24	10150.80	-23.34
17059.00	V	39.22	Ambient	10.96	44.52	-38.77	55.93	626.08	10150.80	-24.20
21933.00	H	19.54	Ambient	2.21	40.58	-28.90	33.43	46.91	10150.80	-46.70
21933.00	V	19.82	Ambient	2.21	40.58	-28.90	33.71	48.45	10150.80	-46.42
24370.00	H	20.31	Ambient	2.23	40.63	-29.36	33.81	49.01	10150.80	-46.32
24370.00	V	20.32	Ambient	2.23	40.63	-29.36	33.82	49.07	10150.80	-46.31

Test Details	
Manufacturer	The Chamberlain Group, Inc.
EUT	Access Control Hub
Model No.	CAPAC
Mode	Wi-Fi – 802.11n
Frequency Tested	2462MHz
Notes	Peak Measurements in the Restricted Bands

Freq. (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Peak Total dBµV/m at 3m	Peak Total µV/m at 3 m	Peak Limit µV/m at 3 m	Margin (dB)
4924.00	H	50.46	Ambient	5.77	36.24	-40.27	52.19	406.94	5000.00	-21.79
4924.00	V	50.70	Ambient	5.77	36.24	-40.27	52.43	418.34	5000.00	-21.55
7386.00	H	49.86	Ambient	6.89	38.05	-40.05	54.75	546.41	5000.00	-19.23
7386.00	V	49.59	Ambient	6.89	38.05	-40.05	54.48	529.69	5000.00	-19.50
12310.00	H	49.41	Ambient	9.30	41.60	-39.57	60.74	1088.32	5000.00	-13.24
12310.00	V	49.44	Ambient	9.30	41.60	-39.57	60.77	1092.08	5000.00	-13.21
19696.00	H	29.60	Ambient	2.23	40.40	-28.04	44.18	161.89	5000.00	-29.79
19696.00	V	29.99	Ambient	2.23	40.40	-28.04	44.57	169.33	5000.00	-29.40
22158.00	H	30.56	Ambient	2.21	40.58	-28.73	44.62	170.31	5000.00	-29.35
22158.00	V	31.06	Ambient	2.21	40.58	-28.73	45.12	180.40	5000.00	-28.85

Test Details	
Manufacturer	The Chamberlain Group, Inc.
EUT	Access Control Hub
Model No.	CAPAC
Mode	Wi-Fi – 802.11n
Frequency Tested	2462MHz
Notes	Average Measurements in the Restricted Bands

Freq. (MHz)	Ant Pol	Meter Reading (dBμV)	Ambient	CBL Fac. (dB)	Ant Fac. (dB/m)	Pre Amp (dB)	Duty Cycle (dB)	Ave. Total dBμV/m at 3m	Ave. Total μV/m at 3 m	Ave. Limit μV/m at 3 m	Margin (dB)
4924.00	H	35.58	Ambient	5.77	36.24	-40.27	0.00	37.31	73.37	500.00	-16.67
4924.00	V	35.55	Ambient	5.77	36.24	-40.27	0.00	37.28	73.12	500.00	-16.70
7386.00	H	35.02	Ambient	6.89	38.05	-40.05	0.00	39.91	98.97	500.00	-14.07
7386.00	V	35.27	Ambient	6.89	38.05	-40.05	0.00	40.16	101.86	500.00	-13.82
12310.00	H	34.46	Ambient	9.30	41.60	-39.57	0.00	45.79	194.65	500.00	-8.19
12310.00	V	34.43	Ambient	9.30	41.60	-39.57	0.00	45.76	193.98	500.00	-8.22
19696.00	H	15.32	Ambient	2.23	40.40	-28.04	0.00	29.90	31.28	500.00	-24.07
19696.00	V	15.16	Ambient	2.23	40.40	-28.04	0.00	29.74	30.71	500.00	-24.23
22158.00	H	16.27	Ambient	2.21	40.58	-28.73	0.00	30.33	32.86	500.00	-23.64
22158.00	V	16.11	Ambient	2.21	40.58	-28.73	0.00	30.17	32.26	500.00	-23.80

Test Details	
Manufacturer	The Chamberlain Group, Inc.
EUT	Access Control Hub
Model No.	CAPAC
Mode	Wi-Fi – 802.11n
Frequency Tested	2462MHz
Notes	Peak Measurements in Non-Restricted Bands

Freq. (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Peak Total dBµV/m at 3m	Peak Total µV/m at 3 m	Peak Limit µV/m at 3 m	Margin (dB)
2462.00	H	60.75		4.32	32.99	0.00	98.06	79966.39		
2462.00	V	55.08		4.32	32.99	0.00	92.39	41630.10		
9848.00	H	38.28	Ambient	8.27	39.34	-39.53	46.35	207.78	7996.64	-31.71
9848.00	V	38.96	Ambient	8.27	39.34	-39.53	47.03	224.70	7996.64	-31.03
14772.00	H	38.18	Ambient	9.79	42.23	-40.30	49.90	312.71	7996.64	-28.16
14772.00	V	38.42	Ambient	9.79	42.23	-40.30	50.14	321.47	7996.64	-27.92
17234.00	H	39.16	Ambient	11.02	44.13	-38.96	55.35	585.36	7996.64	-22.71
17234.00	V	38.78	Ambient	11.02	44.13	-38.96	54.97	560.31	7996.64	-23.09
24620.00	H	21.50	Ambient	2.22	40.64	-29.01	35.34	58.51	7996.64	-42.71
24620.00	V	20.84	Ambient	2.22	40.64	-29.01	34.68	54.23	7996.64	-43.37

25. Band-Edge Compliance

EUT Information	
Manufacturer	The Chamberlain Group, Inc.
Product	Access Control Hub
Model No.	CAPAC
Mode	Wi-Fi

Test Setup Details	
Setup Format	Tabletop
Measurement Method	Radiated
Type of Test Site	Semi-Anechoic Chamber
Test Site Used	Room 21
Notes	N/A

Measurement Uncertainty	
Measurement Type	Expanded Measurement Uncertainty
Radiated disturbance (electric field strength on an open area test site or alternative test site) (30 MHz – 1000 MHz)	4.3
Radiated disturbance (electric field strength on an open area test site or alternative test site) (1 GHz – 6 GHz)	3.1

## Procedure

## 1) Low Band Edge:

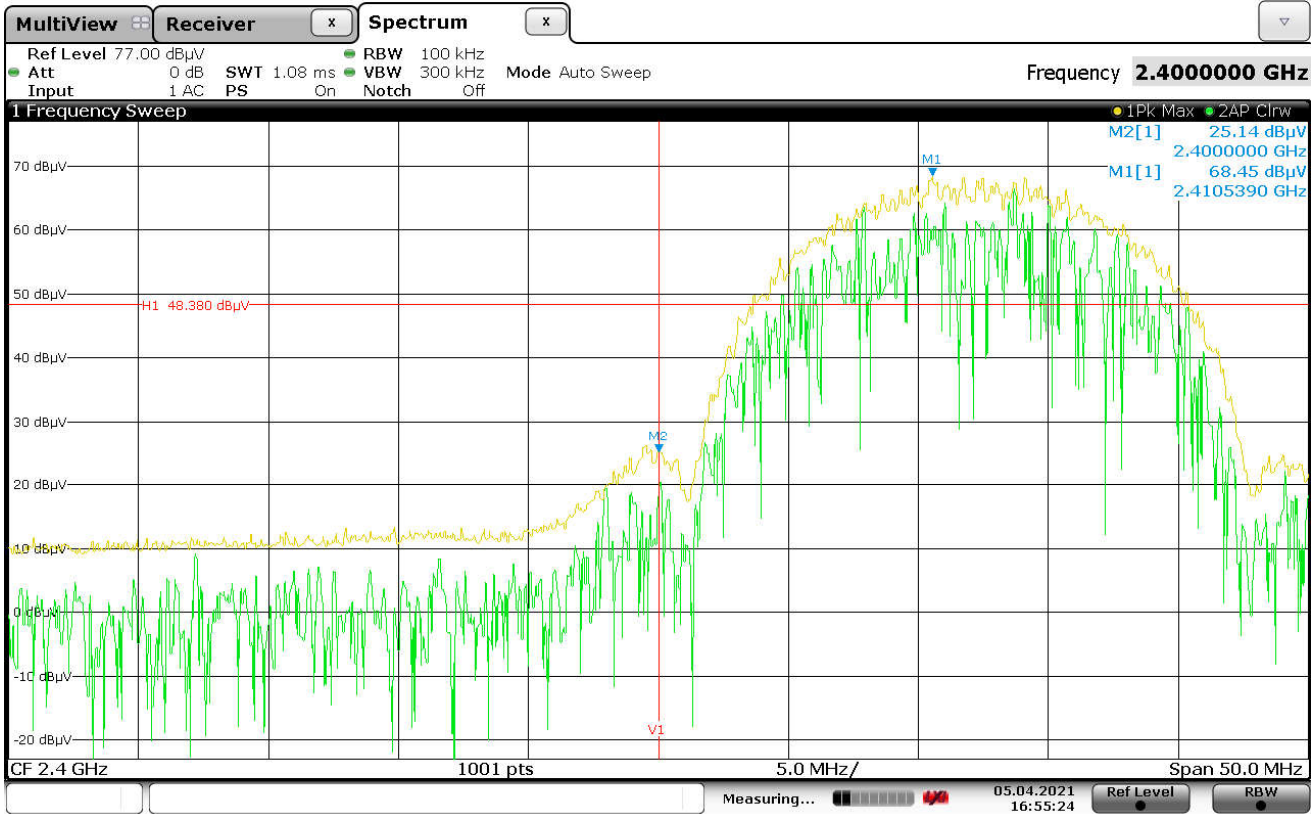
- a) The EUT was setup inside the test chamber on a non-conductive stand and a broadband measuring antenna was placed at a test distance of 3 meters from the EUT.
- b) The EUT was set to transmit continuously at the channel closest to the low band-edge.
- c) The EUT was maximized for worst case emissions at the measuring antenna and the maximum meter reading was recorded.
- d) To determine the band edge compliance, the following spectrum analyzer settings were used:
  - o Center Frequency = 2400MHz (low band-edge frequency).
  - o Span = Wide enough to capture the peak level of the emission operating on the channel closest to the band-edge, as well as any modulation products which fall outside of the authorized band of operation.
  - o Resolution Bandwidth (RBW) =  $\geq 1\%$  of the span.
  - o 'Max-Hold' function was engaged.
- e) The analyzer was allowed to scan until the envelope of the transmitter bandwidth was defined.
- f) The marker was set on the peak of the in-band emissions. A display line was placed 20dB down from the peak of the in-band emissions. All emissions which fall outside of the authorized band of operation must be below the 20dB down display line. (All emissions to the left of the center frequency (band-edge) must be below the display line.)
- g) The analyzer's display was then screenshot and saved.

## 2) High Band Edge

- a) The EUT was setup inside the test chamber on a non-conductive stand and set to transmit continuously at the channel closest to the high band-edge.
- b) A broadband measuring antenna was placed at a test distance of 3 meters from the EUT. The antenna was connected to the input of a spectrum analyzer.
- c) The center frequency of the analyzer was set to the high band edge (2483.5MHz).
- d) The Resolution Bandwidth was set to 1MHz.
- e) To ensure that the maximum or worst case emission level was measured, the following steps were taken:
  - o The EUT was rotated so that all of its sides were exposed to the receiving antenna.
  - o Since the measuring antenna is linearly polarized, both horizontal and vertical field components were measured.
  - o The EUT was rotated so that all of its sides were exposed to the receiving antenna.
  - o The measuring antenna was raised and lowered from 1 to 4 meters for each antenna polarization to maximize the readings.
  - o The highest measured peak reading and the highest measured average reading were recorded.

Test Details	
Manufacturer	The Chamberlain Group, Inc.
EUT	Access Control Hub
Model No.	CAPAC
Mode	Wi-Fi – 802.11b
Frequency Tested	2412MHz
Notes	Low Band Edge

### BAND EDGE – LOW

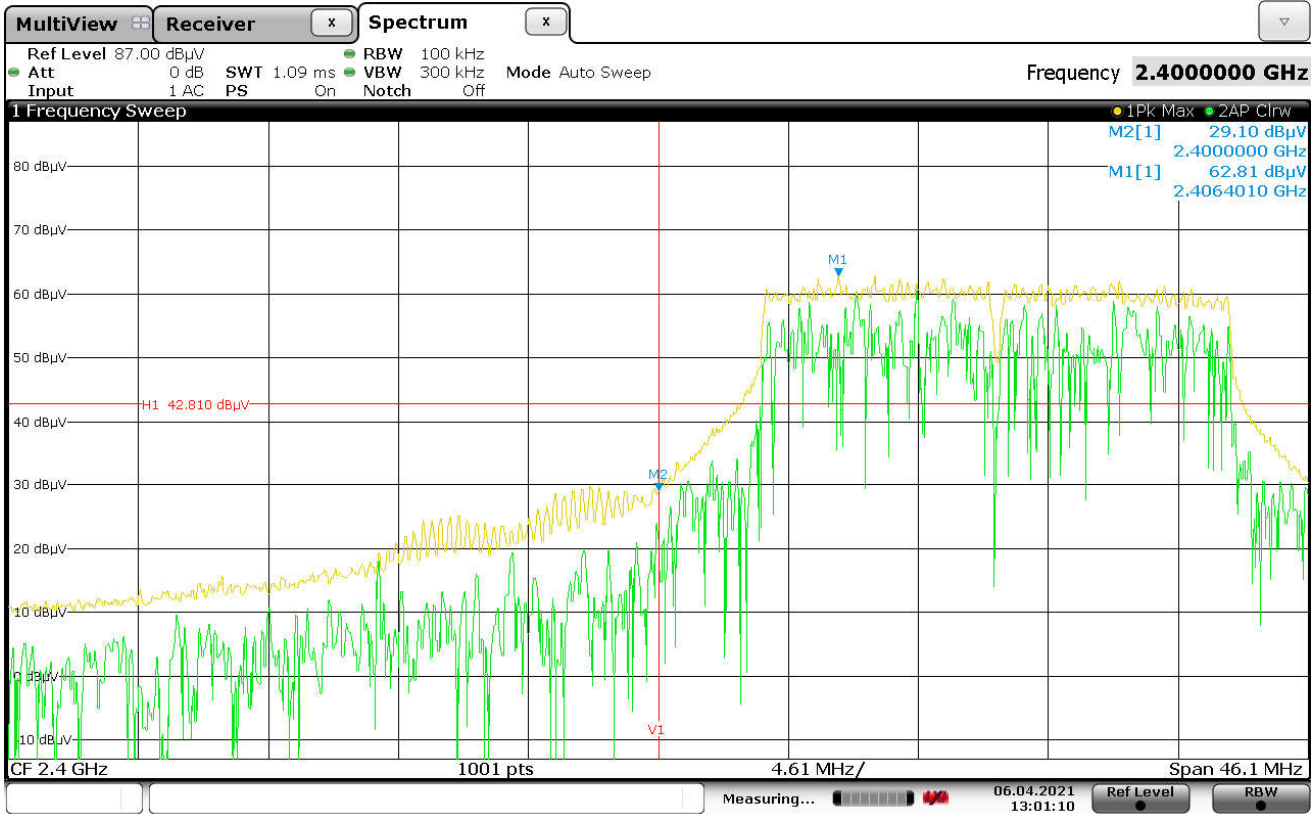


Date: 5.APR.2021 16:55:24



Test Details	
Manufacturer	The Chamberlain Group, Inc.
EUT	Access Control Hub
Model No.	CAPAC
Mode	Wi-Fi – 802.11g
Frequency Tested	2412MHz
Notes	Low Band Edge

### BAND EDGE – LOW



Date: 6.APR.2021 13:01:09

Test Details	
Manufacturer	The Chamberlain Group, Inc.
EUT	Access Control Hub
Model No.	CAPAC
Mode	Wi-Fi – 802.11n
Frequency Tested	2412MHz
Notes	Low Band Edge

### BAND EDGE – LOW



Date: 6.APR.2021 16:33:53

Test Details	
Manufacturer	The Chamberlain Group, Inc.
EUT	Access Control Hub
Model No.	CAPAC
Mode	Wi-Fi
Frequency Tested	2462MHz
Notes	High Band Edge

**BAND EDGE – HIGH - PEAK**

Mode	Freq. (MHz)	Ant. Pol.	Meter Reading (dBµV)	CBL Fac. (dB)	Ant. Fac. (dB)	Pre Amp (dB)	Peak Total dBµV/m at 3m	Peak Total µV/m at 3m	Peak Limit µV/m at 3m	Margin (dB)
802.11b	2483.50	H	22.12	4.33	33.09	0.00	59.55	949.20	5000.00	-14.43
	2483.50	V	23.30	4.33	33.09	0.00	60.73	1087.32	5000.00	-13.25
802.11g	2483.50	H	34.28	4.33	33.09	0.00	71.71	3849.09	5000.00	-2.27
	2483.50	V	33.24	4.33	33.09	0.00	70.67	3414.74	5000.00	-3.31
802.11n	2483.50	H	28.39	4.33	33.09	0.00	65.82	1953.70	5000.00	-8.16
	2483.50	V	24.42	4.33	33.09	0.00	61.85	1236.97	5000.00	-12.13

**BAND EDGE – HIGH - AVERAGE**

Mode	Freq. (MHz)	Ant. Pol.	Meter Reading (dBµV)	CBL Fac. (dB)	Ant. Fac. (dB)	Pre Amp (dB)	Duty Cycle (dB)	Average Total dBµV/m at 3m	Average Total µV/m at 3m	Average Limit µV/m at 3m	Margin (dB)
802.11b	2483.50	H	9.45	4.33	33.09	0.00	0.00	46.88	220.73	500.00	-7.10
	2483.50	V	10.40	4.33	33.09	0.00	0.00	47.83	246.24	500.00	-6.15
802.11g	2483.50	H	15.07	4.33	33.09	0.00	0.00	52.50	421.56	500.00	-1.48
	2483.50	V	14.38	4.33	33.09	0.00	0.00	51.81	389.37	500.00	-2.17
802.11n	2483.50	H	10.29	4.33	33.09	0.00	0.00	47.72	243.14	500.00	-6.26
	2483.50	V	11.41	4.33	33.09	0.00	0.00	48.84	276.60	500.00	-5.14

## 26. Scope of Accreditation

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

ELITE ELECTRONIC ENGINEERING, INC.  
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Downers Grove, IL 60515  
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Email: [rbugielski@elitetest.com](mailto:rbugielski@elitetest.com)  
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Brandon Lugo (Automotive Team Leader) Phone: 630 495 9770 ext. 163  
Email: [blugo@elitetest.com](mailto:blugo@elitetest.com)  
Richard King (FCC/Commercial Team Leader) Phone: 630 495 9770 ext. 123  
Email: [reking@elitetest.com](mailto:reking@elitetest.com)  
Website: [www.elitetest.com](http://www.elitetest.com)

## ELECTRICAL

Valid to: June 30, 2021

Certificate Number: 1786.01

In recognition of the successful completion of the A2LA Accreditation Program evaluation process, accreditation is granted to this laboratory to perform the following automotive electromagnetic compatibility and other electrical tests:

**Test Technology:****Test Method(s) <sup>1</sup>:*****Transient Immunity***

ISO 7637-2 (including emissions); ISO 7637-3;  
ISO 16750-2:2012, Sections 4.6.3 and 4.6.4;  
CS-11979, Section 6.4; CS.00054, Section 5.9;  
EMC-CS-2009.1 (CI220); FMC1278 (CI220, CI221, CI222);  
GMW 3097, Section 3.5;  
SAE J1113-11; SAE J1113-12;  
ECE Regulation 10.06 Annex 10

***Electrostatic Discharge (ESD)***

ISO 10605 (2001, 2008);  
CS-11979 Section 7.0; CS.00054, Section 5.10;  
EMC-CS-2009.1 (CI 280); FMC1278 (CI280); SAE J1113-13;  
GMW 3097 Section 3.6

***Conducted Emissions***

CISPR 25 (2002, 2008), Sections 6.2 and 6.3;  
CISPR 25 (2016), Sections 6.3 and 6.4;  
CS-11979, Section 5.1; CS.00054, Sections 5.6.1 and 5.6.2;  
GMW 3097, Section 3.3.2;  
EMC-CS-2009.1 (CE 420); FMC1278 (CE420, CE421)

(A2LA Cert. No. 1786.01) Revised 12/02/2020



Page 1 of 8

5202 Presidents Court, Suite 220 | Frederick, MD 21703-8515 | Phone: 301 644 3248 | Fax: 240 454 9449 | [www.A2LA.org](http://www.A2LA.org)

**Test Technology:**

**Test Method(s) <sup>1</sup>:**

*Radiated Emissions Anechoic*

CISPR 25 (2002, 2008), Section 6.4;  
 CISPR 25 (2016), Section 6.5;  
 CS-11979, Section 5.3; CS.00054, Section 5.6.3;  
 GMW 3097, Section 3.3.1;  
 EMC-CS-2009.1 (RE 310); FMC1278 (RE310);  
 ECE Regulation 10.06 Annex 7 (Broadband)  
 ECE Regulation 10.06 Annex 8 (Narrowband)

*Vehicle Radiated Emissions*

CISPR 12; ICES-002; ECE Regulation 10.06 Annex 5

*Bulk Current Injection (BCI)*

ISO 11452-4;  
 CS-11979, Section 6.1; CS.00054, Section 5.8.1;  
 GMW 3097, Section 3.4.1;  
 SAE J1113-4;  
 EMC-CS-2009.1 (RII12); FMC1278 (RII12);  
 ECE Regulation 10.06 Annex 9

*Bulk Current Injections (BCI)  
 (Closed Loop Method)*

ISO 11452-4; SAE J1113-4

*Radiated Immunity Anechoic  
 (Including Radar Pulse)*

ISO 11452-2; ISO 11452-5;  
 CS-11979, Section 6.2; CS.00054, Section 5.8.2;  
 GMW 3097, Section 3.4.2;  
 EMC-CS-2009.1 (RII14); FMC1278 (RII14); SAE J1113-21;  
 ECE Regulation 10.06 Annex 9

*Radiated Immunity Magnetic Field*

ISO 11452-8

*Radiated Immunity Reverb*

ISO/IEC 61000-4-21;  
 GMW 3097, Section 3.4.3;  
 EMC-CS-2009.1 (RII14); FMC1278 (RII14);  
 ISO 11452-11

*Radiated Immunity  
 (Portable Transmitters)*

ISO 11452-9;  
 EMC-CS-2009.1 (RII15); FMC1278 (RII15)

*Vehicle Radiated Immunity (ALSE)*

ISO 11451-2; ECE Regulation 10.06 Annex 6

*Electrical Loads*

ISO 16750-2, Sections 4.2, 4.3, 4.4, 4.5, 4.6, 4.7,  
 4.8, 4.9, 4.11, and 4.12

*Dielectric Withstand Voltage*

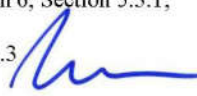
MIL-STD-202, Method 301;  
 EIA-364-20D

*Insulation Resistance*

MIL-STD-202, Method 302;  
 SAE/USCAR-2, Revision 6, Section 5.5.1;  
 EIA-364-21D

*Contact Resistance*

MIL-STD-202, Method 307;  
 SAE/USCAR-2, Revision 6, Section 5.3.1;  
 EIA-364-23C;  
 USCAR21-3 Section 4.5.3



**Test Technology:**

**Test Method(s) <sup>1</sup>:**

*DC Resistance*

MIL-STD-202, Method 303

*Contact Chatter*

MIL-STD-202, Method 310;  
SAE/USCAR-2, Revision 6, Section 5.1.9

*Voltage Drop*

SAE/USCAR-2, Revision 6, Section 5.3.2;  
USCAR21-3 Section 4.5.6

**Emissions**

Radiated and Conducted  
(3m Semi-anechoic chamber,  
up to 40 GHz)

47 CFR, FCC Part 15 B (using ANSI C63.4:2014);  
47 CFR, FCC Part 18 (using FCC MP-5:1986);  
ICES-001; ICES-003; ICES-005;  
IEC/CISPR 11, Ed. 4.1 (2004-06); AS/NZS CISPR 11 (2004);  
IEC/CISPR 11 Ed 5 (2009-05) + A1 (2010);  
KN 11 (2008-5) with RRL Notice No. 2008-3 (May 20, 2008);  
CISPR 11; EN 55011; KN 11; CNS 13803 (1997, 2003);  
CISPR 14-1; EN 55014-1; AS/NZS CISPR 14.1; KN 14-1;  
IEC/CISPR 22 (1997); EN 55022 (1998) + A1(2000);  
EN 55022 (1998) + A1(2000) + A2(2003); EN 55022 (2006);  
IEC/CISPR 22 (2008-09); AS/NZS CISPR 22 (2004);  
AS/NZS CISPR 22, 3rd Edition (2006); KN 22 (up to 6 GHz);  
CNS 13438 (up to 6 GHz); VCCI V-3 (up to 6 GHz);  
CISPR 32; EN 55032; KN 32; ECE Regulation 10.06 Annex 14

Current Harmonics

IEC 61000-3-2; EN 61000-3-2; KN 61000-3-2;  
ECE Regulation 10.06 Annex 11

Flicker and Fluctuations

IEC 61000-3-3; EN 61000-3-3; KN 61000-3-3;  
ECE Regulation 10.06 Annex 12

**Immunity**

Electrostatic Discharge

IEC 61000-4-2, Ed. 1.2 (2001);  
IEC 61000-4-2 (1995) + A1(1998) + A2(2000);  
EN 61000-4-2 (1995); EN 61000-4-2 (2009-05);  
KN 61000-4-2 (2008-5); RRL Notice No. 2008-4 (May 20, 2008);  
IEC 61000-4-2; EN 61000-4-2; KN 61000-4-2;  
IEEE C37.90.3 2001

Radiated Immunity

IEC 61000-4-3 (1995) + A1(1998) + A2(2000);  
IEC 61000-4-3, Ed. 3.0 (2006-02);  
IEC 61000-4-3, Ed. 3.2 (2010);  
KN 61000-4-3 (2008-5); RRL Notice No. 2008-4 (May 20, 2008);  
IEC 61000-4-3; EN 61000-4-3; KN 61000-4-3;  
IEEE C37.90.2 2004

Electrical Fast Transient/Burst

IEC 61000-4-4, Ed. 2.0 (2004-07); IEC 61000-4-4, Ed. 2.1 (2011);  
IEC 61000-4-4 (1995) + A1(2000) + A2(2001);  
KN 61000-4-4 (2008-5); RRL Notice No. 2008-5 (May 20, 2008);  
IEC 61000-4-4; EN 61000-4-4; KN 61000-4-4;  
ECE Regulation 10.06 Annex 15





**Test Technology:**

**Test Method(s) <sup>1</sup>:**

**Immunity (cont'd)**

Surge

IEC 61000-4-5 (1995) + A1(2000);  
 IEC 61000-4-5, Ed 1.1 (2005-11);  
 EN 61000-4-5 (1995) + A1(2001);  
 KN 61000-4-5 (2008-5); RRL Notice No. 2008-4 (May 20, 2008);  
 IEC 61000-4-5; EN 61000-4-5; KN 61000-4-5;  
 IEEE C37.90.1 2012; IEEE STD C62.41.2 2002;  
 ECE Regulation 10.06 Annex 16

Conducted Immunity

IEC 61000-4-6 (1996) + A1(2000);  
 IEC 61000-4-6, Ed 2.0 (2006-05);  
 IEC 61000-4-6 Ed. 3.0 (2008);  
 KN 61000-4-6 (2008-5); RRL Notice No. 2008-4 (May 20, 2008);  
 EN 61000-4-6 (1996) + A1(2001); IEC 61000-4-6; EN 61000-4-6;  
 KN 61000-4-6

Power Frequency Magnetic Field Immunity

IEC 61000-4-8 (1993) + A1(2000); IEC 61000-4-8 (2009);  
 EN 61000-4-8 (1994) + A1(2000);  
 KN 61000-4-8 (2008-5); RRL Notice No. 2008-4 (May 20, 2008);  
 IEC 61000-4-8; EN 61000-4-8; KN 61000-4-8

Voltage Dips, Short Interrupts, and Line Voltage Variations

IEC 61000-4-11, Ed. 2 (2004-03);  
 KN 61000-4-11 (2008-5);  
 RRL Notice No. 2008-4 (May 20, 2008);  
 IEC 61000-4-11; EN 61000-4-11; KN 61000-4-11

Ring Wave

IEC 61000-4-12, Ed. 2 (2006-09);  
 EN 61000-4-12:2006;  
 IEC 61000-4-12; EN 61000-4-12; KN 61000-4-12;  
 IEEE STD C62.41.2 2002

Generic and Product Specific EMC Standards

IEC/EN 61000-6-1; AS/NZS 61000-6-1; KN 61000-6-1;  
 IEC/EN 61000-6-2; AS/NZS 61000-6-2; KN 61000-6-2;  
 IEC/EN 61000-6-3; AS/NZS 61000-6-3; KN 61000-6-3;  
 IEC/EN 61000-6-4; AS/NZS 61000-6-4; KN 61000-6-4;  
 EN 50130-4; EN 61326-1;  
 IEC/CISPR 14-2; EN 55014-2; AS/NZS CISPR 14.2; KN 14-2;  
 IEC/CISPR 24; AS/NZS CISPR 24; EN 55024; KN 24;  
 IEC 60601-1-2; JIS T0601-1-2

*TxRx EMC Requirements*

EN 301 489-1; EN 301 489-3; EN 301 489-9; EN 301 489-17;  
 EN 301 489-19

*European Radio Test Standards*

ETSI EN 300 086-1; ETSI EN 300 086-2;  
 ETSI EN 300 113-1; ETSI EN 300 113-2;  
 ETSI EN 300 220-1; ETSI EN 300 220-2;  
 ETSI EN 300 330-1; ETSI EN 300 330-2;  
 ETSI EN 300 440-1; ETSI EN 300 440-2;  
 ETSI EN 300 422-1; ETSI EN 300 422-2;



**Test Technology:**

**Test Method(s) <sup>1</sup>:**

*European Radio Test Standards  
(cont'd)*

ETSI EN 300 328; ETSI EN 301 893;  
ETSI EN 301 511; ETSI EN 301 908-1;  
ETSI EN 908-2; ETSI EN 908-13;  
ETSI EN 303 413; ETSI EN 302 502

*Canadian Radio Tests*

RSS-102 (RF Exposure Evaluation only); RSS-111; RSS-112;  
RSS-117; RSS-119; RSS-123; RSS-125; RSS-127; RSS-130;  
RSS-131; RSS-132; RSS-133; RSS-134; RSS-135; RSS-137;  
RSS-139; RSS-140; RSS-141; RSS-142; RSS-170; RSS-181;  
RSS-182; RSS-191; RSS-192; RSS-194; RSS-195; RSS-196;  
RSS-197; RSS-199; RSS-210; RSS-211; RSS-213; RSS-215;  
RSS-216; RSS-220; RSS-222; RSS-236; RSS-238; RSS-243;  
RSS-244; RSS-247; RSS-251; RSS-252; RSS-287;  
RSS-288; RSS-310; RSS-GEN

*Mexico Radio Tests*

IFT-008-2015; NOM-208-SCFI-2016

*Japan Radio Tests*

Radio Law No. 131, Ordinance of MPT No. 37, 1981,  
MIC Notification No. 88:2004, Table No. 22-11;  
ARIB STD-T66, Regulation 18

*Taiwan Radio Tests*

LP-0002

*Australia/New Zealand Radio Tests*

AS/NZS 4268; Radiocommunications (Short Range Devices)  
Standard (2014)

*Hong Kong Radio Tests*

HKCA 1039 Issue 6; HKCA 1042; HKCA 1033 Issue 7;  
HKCA 1061; HKCA 1008; HKCA 1043; HKCA 1057;  
HKCA 1073

*Korean Radio Test Standards*

KN 301 489-1; KN 301 489-3; KN 301 489-9; KN 301 489-17;  
KN 301 489-52

*Unlicensed Radio Frequency Devices  
(3 Meter Semi-Anechoic Room)*

47 CFR FCC Part 15C, 15D, 15E, 15F, 15G, 15H  
(using ANSI C63.10:2013, ANSI C63.17:2013 and  
FCC KDB 905462 D02 (v02))

*Licensed Radio Service Equipment*

47 CFR FCC Parts 20, 22, 24, 25, 27, 30, 73, 74, 80, 87,  
90, 95, 96, 97, 101;  
ANSI/TIA-603-E; TIA-102.CAAA-E; ANSI C63.26:2015;

*OTA (Over the Air) Performance*

GSM, GPRS, EGPRS  
UMTS (W-CDMA)  
LTE including CAT MI  
A-GPS for UMTS/GSM  
LTS A-GPS, A-GLONASS,  
SIB8/SIB16  
Large Device/Laptop/Tablet Testing  
Integrated Device Testing  
WiFi 802.11 a/b/g/n/a

CTIA Test Plan for Wireless Device Over-the-Air Performance  
(Method for Measurement for Radiated Power and Receiver  
Performance) V3.8.2;  
CTIA Test Plan for RF Performance Evaluation of WiFi Mobile  
Converged Devices V2.1.0



**Test Technology:**

**Test Method(s) <sup>1</sup>:**

***Electrical Measurements and Simulation***

**AC Voltage / Current**

(1mV to 5kV) 60 Hz  
(0.1V to 250V) up to 500 MHz  
(1µA to 150A) 60 Hz

FAA AC 150/5345-10H

FAA AC 150/5345-43J

FAA AC 150/5345-44K

FAA AC 150/5345-46E

**DC Voltage / Current**

(1mV to 15-kV) / (1µA to 10A)

FAA AC 150/5345-47C

FAA EB 67D

**Power Factor / Efficiency / Crest Factor**

(Power to 30kW)

**Resistance**

(1mΩ to 4000MΩ)

**Surge**

(Up to 10 kV / 5 kA) (Combination Wave and Ring Wave)

**On the following products and materials:**

Telecommunications Terminal Equipment (TTE), Radio Equipment, Network Equipment, Information Technology Equipment (ITE), Automotive Electronic Equipment, Automotive Hybrid Electronic Devices, Maritime Navigation and Radio Communication Equipment and Systems, Vehicles, Boats and Internal Combustion Engine Driven Devices, Automotive, Aviation, and General Lighting Products, Medical Electrical Equipment, Motors, Industrial, Scientific and Medical (ISM) Radio-Frequency Equipment, Household Appliances, Electric Tools, Low-voltage Switchgear and Control gear, Programmable Controllers, Electrical Equipment for Measurement, Control and Laboratory Use, Base Materials, Power and Data Transmission Cables and Connectors

<sup>1</sup> When the date, revision or edition of a test method standard is not identified on the scope of accreditation, the laboratory is expected to be using the current version within one year of the date of publication, per part C., Section 1 of A2LA R101 - *General Requirements - Accreditation of ISO-IEC 17025 Laboratories.*

Testing Activities Performed in Support of FCC Certification in Accordance with 47 Code of Federal Regulations and FCC KDB 974614, Appendix A, Table A.1<sup>2</sup>

<b>Rule Subpart/Technology</b>	<b>Test Method</b>	<b>Maximum Frequency (MHz)</b>
<b><u>Unintentional Radiators</u></b>		
Part 15B	ANSI C63.4:2014	40000
<b><u>Industrial, Scientific, and Medical Equipment</u></b>		
Part 18	FCC MP-5 (February 1986)	40000
<b><u>Intentional Radiators</u></b>		
Part 15C	ANSI C63.10:2013	40000
<b><u>Unlicensed Personal Communication Systems Devices</u></b>		
Part 15D	ANSI C63.17:2013	40000



Testing Activities Performed in Support of FCC Certification in Accordance with 47 Code of Federal Regulations and FCC KDB 974614, Appendix A, Table A.1<sup>2</sup>

<b>Rule Subpart/Technology</b>	<b>Test Method</b>	<b>Maximum Frequency (MHz)</b>
<u>U-NII without DFS Intentional Radiators</u> Part 15E	ANSI C63.10:2013	40000
<u>U-NII with DFS Intentional Radiators</u> Part 15E	FCC KDB 905462 D02 (v02)	40000
<u>UWB Intentional Radiators</u> Part 15F	ANSI C63.10:2013	40000
<u>BPL Intentional Radiators</u> Part 15G	ANSI C63.10:2013	40000
<u>White Space Device Intentional Radiators</u> Part 15H	ANSI C63.10:2013	40000
<u>Commercial Mobile Services (FCC Licensed Radio Service Equipment)</u> Parts 22 (cellular), 24, 25 (below 3 GHz), and 27	ANSI/TIA-603-E; TIA-102.CAAA-E; ANSI C63.26:2015	40000
<u>General Mobile Radio Services (FCC Licensed Radio Service Equipment)</u> Parts 22 (non-cellular), 90 (below 3 GHz), 95, 97, and 101 (below 3 GHz)	ANSI/TIA-603-E; TIA-102.CAAA-E; ANSI C63.26:2015	40000
<u>Citizens Broadband Radio Services (FCC Licensed Radio Service Equipment)</u> Part 96	ANSI/TIA-603-E; TIA-102.CAAA-E; ANSI C63.26:2015	40000
<u>Maritime and Aviation Radio Services</u> Parts 80 and 87	ANSI/TIA-603-E; ANSI C63.26:2015	40000
<u>Microwave and Millimeter Bands Radio Services</u> Parts 25, 30, 74, 90 (above 3 GHz), 97 (above 3 GHz), and 101	ANSI/TIA-603-E; TIA-102.CAAA-E; ANSI C63.26:2015	40000
<u>Broadcast Radio Services</u> Parts 73 and 74 (below 3 GHz)	ANSI/TIA-603-E; TIA-102.CAAA-E; ANSI C63.26:2015	40000



Testing Activities Performed in Support of FCC Certification in Accordance with 47 Code of Federal Regulations and FCC KDB 974614, Appendix A, Table A.1<sup>2</sup>

<b>Rule Subpart/Technology</b>	<b>Test Method</b>	<b>Maximum Frequency (MHz)</b>
<u>Signal Boosters</u> Part 20 (Wideband Consumer Signal Boosters, Provider-specific signal boosters, and Industrial Signal Boosters) Section 90.219	ANSI C63.26:2015	40000

<sup>2</sup>Accreditation does not imply acceptance to the FCC equipment authorization program. Please see the FCC website (<https://apps.fcc.gov/oetcf/eas/>) for a listing of FCC approved laboratories.

A handwritten signature in blue ink, appearing to be a stylized name.



## Accredited Laboratory

A2LA has accredited

### ELITE ELECTRONIC ENGINEERING INC.

Downers Grove, IL

for technical competence in the field of

### Electrical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 *General requirements for the competence of testing and calibration laboratories*. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).



Presented this 8<sup>th</sup> day of August 2019.



Vice President, Accreditation Services  
For the Accreditation Council  
Certificate Number 1786.01  
Valid to June 30, 2021

*For the tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.*