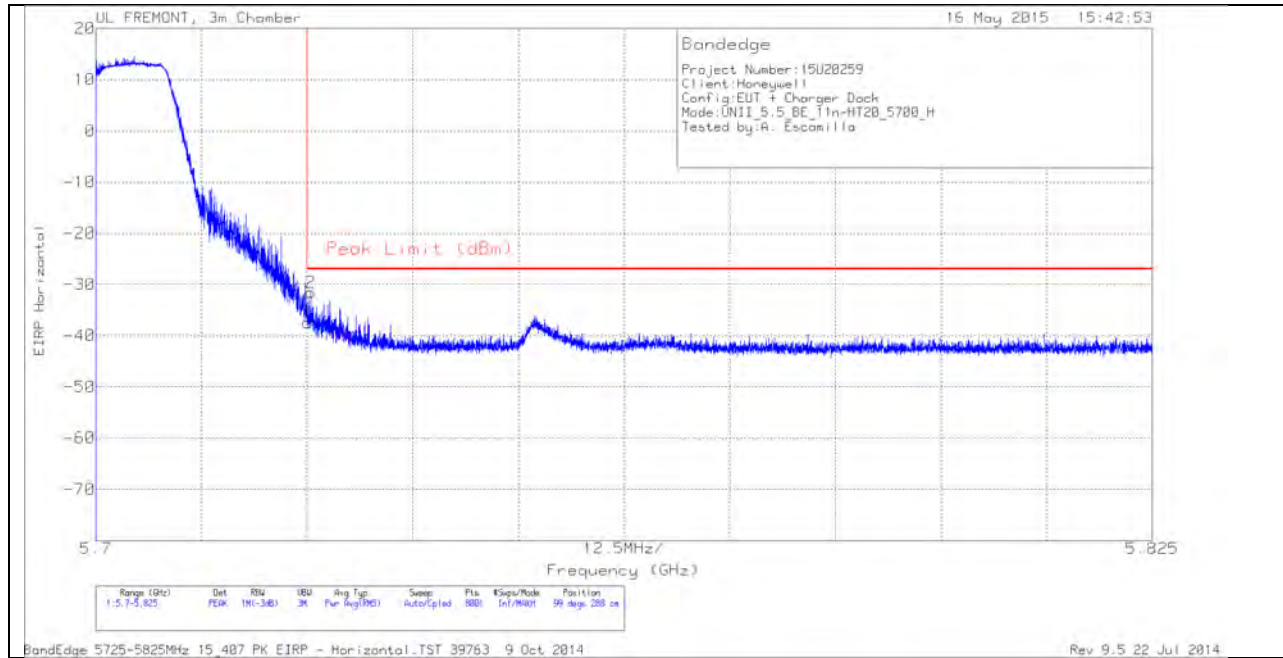


AUTHORIZED BANDEGE (HIGH CHANNEL)

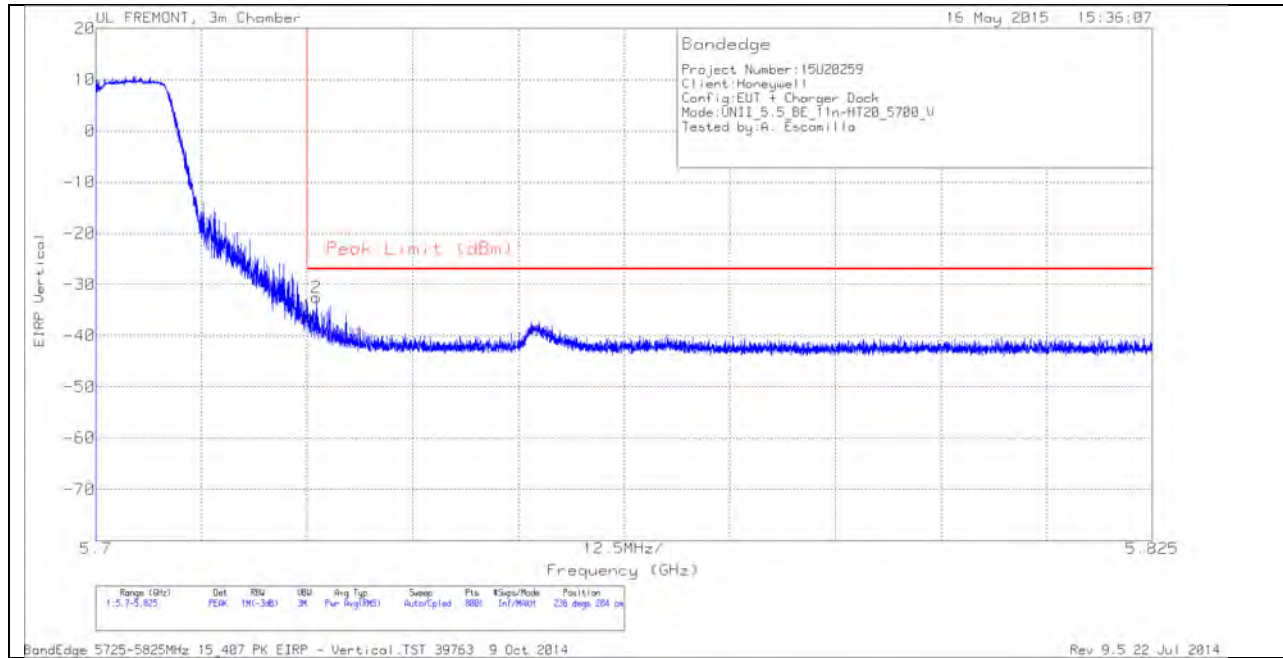
HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T119 (dB/m)	Amp/Cbl/F ltr/Pad (dB)	Conversion Factor (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.725	-62.93	PK	34.8	-21.1	11.8	-37.43	-27	-10.43	99	288	H
2	5.725	-57.02	PK	34.8	-21.1	11.8	-31.52	-27	-4.52	99	288	H

VERTICAL PEAK AND AVERAGE PLOT

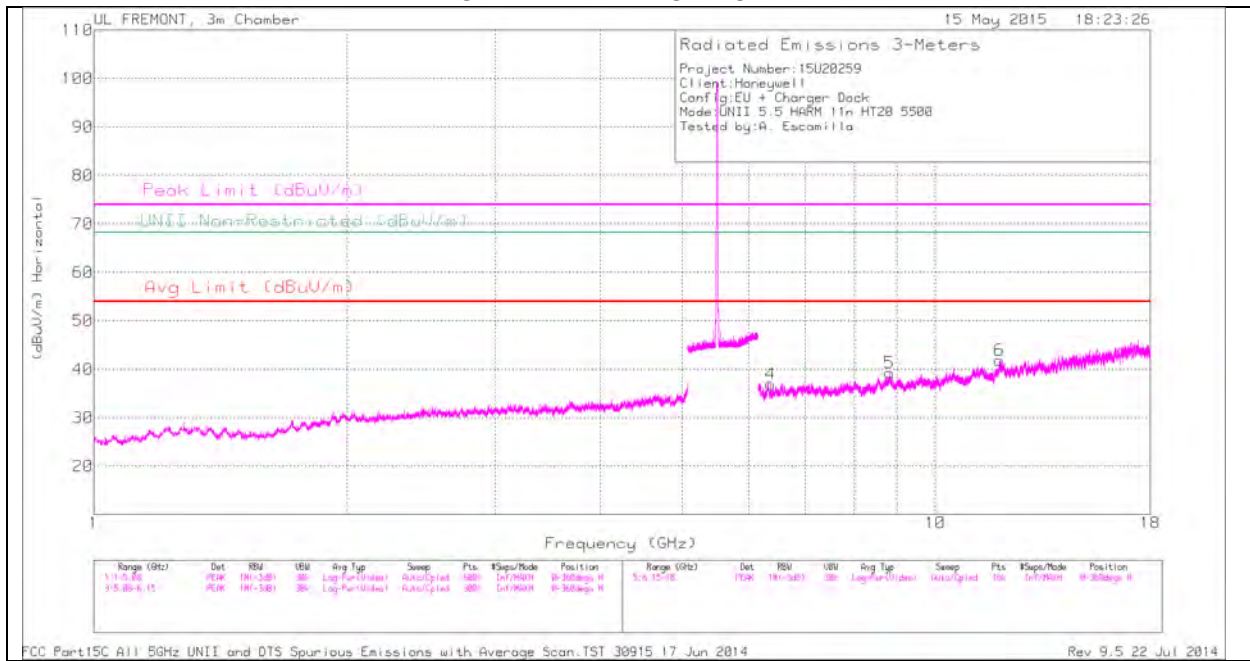


VERTICAL DATA

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T119 (dB/m)	Amp/Cbl/F ltr/Pad (dB)	Conversion Factor (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.725	-61.68	PK	34.8	-21.1	11.8	-36.18	-27	-9.18	236	284	V
2	5.726	-58.03	PK	34.8	-21.1	11.8	-32.53	-27	-5.53	236	284	V

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

UL FREMONT, 3m Chamber

15 May 2015 18:23:26

Radiated Emissions 3-Meters

Project Number: 15U20259
Client: Moneque II
Config: EU + Charger Dock
Mode: UNII 5.5 HARM 11n HT20 5500
Tested by: A. Escamilla

Peak Limit (dBUV/m)
UNII Non-Restricted (dBUV/m)
Avg Limit (dBUV/m)

Frequency (GHz)

Range (GHz)	Det	RBW	VBW	Avg Type	Sweep	Pts	Resolv/Mode	Position	Range (GHz)	Det	RBW	VBW	Avg Type	Sweep	Pts	Resolv/Mode	Position
1.0 - 2.0	Peak	100 kHz	300 Hz	Log Power (dBm)	Cont/Spot	1024	100/Normal	0: Background	4.75 - 6.75	Peak	100 kHz	300 Hz	Log Power (dBm)	Cont/Spot	1024	100/Normal	0: Background
									6.75 - 12.75								0: Background

FCC Part15C All 5GHz UNII and DTS Spurious Emissions with Average Scan.TST 30915 17 Jun 2014

Rev 9.5 22 Jul 2014

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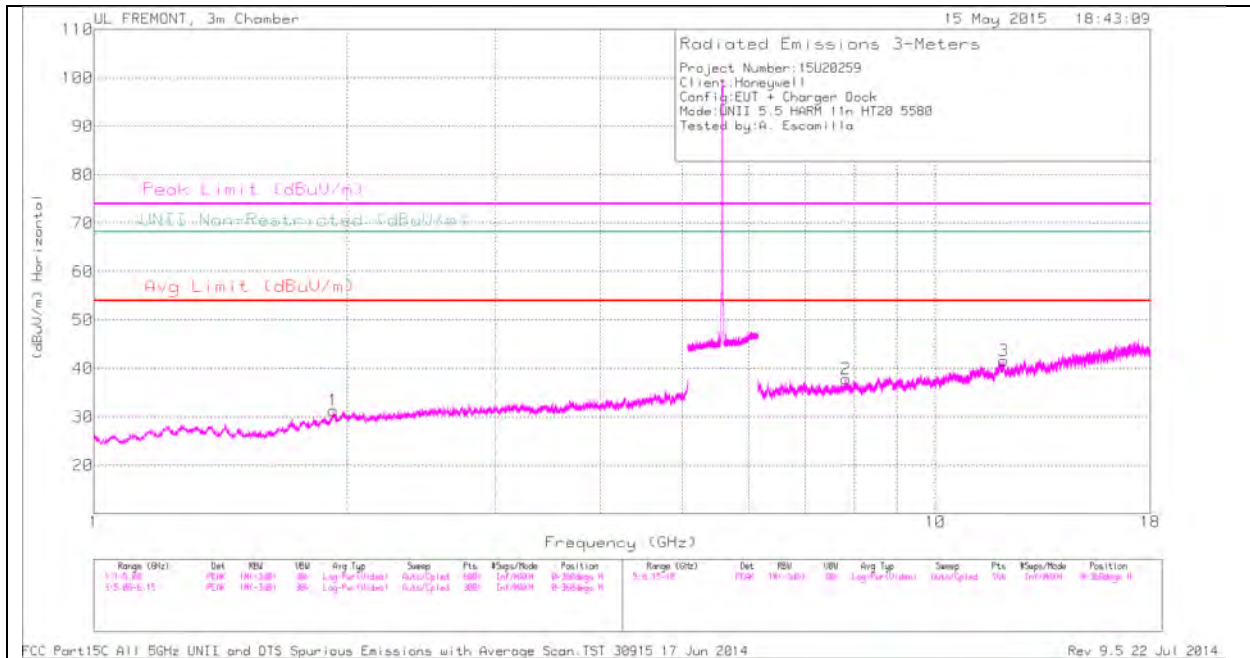
LOW CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/ Ftr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.798	33.27	PK	32.6	-32.4	0	33.47	-	-	74	-40.53	-	-	0-360	200	V
2	4.645	31.82	PK	33.9	-30.2	0	35.52	-	-	74	-38.48	-	-	0-360	200	V
4	6.371	30.9	PK	35.5	-29.5	0	36.9	-	-	-	-	68.2	-31.3	0-360	200	H
5	8.811	28.97	PK	35.9	-25.6	0	39.27	-	-	-	-	68.2	-28.93	0-360	100	H
3	11.326	28.13	PK	38.1	-25.4	0	40.83	-	-	74	-33.17	-	-	0-360	200	V
6	11.919	28.98	PK	39.1	-26.2	0	41.88	-	-	74	-32.12	-	-	0-360	100	H

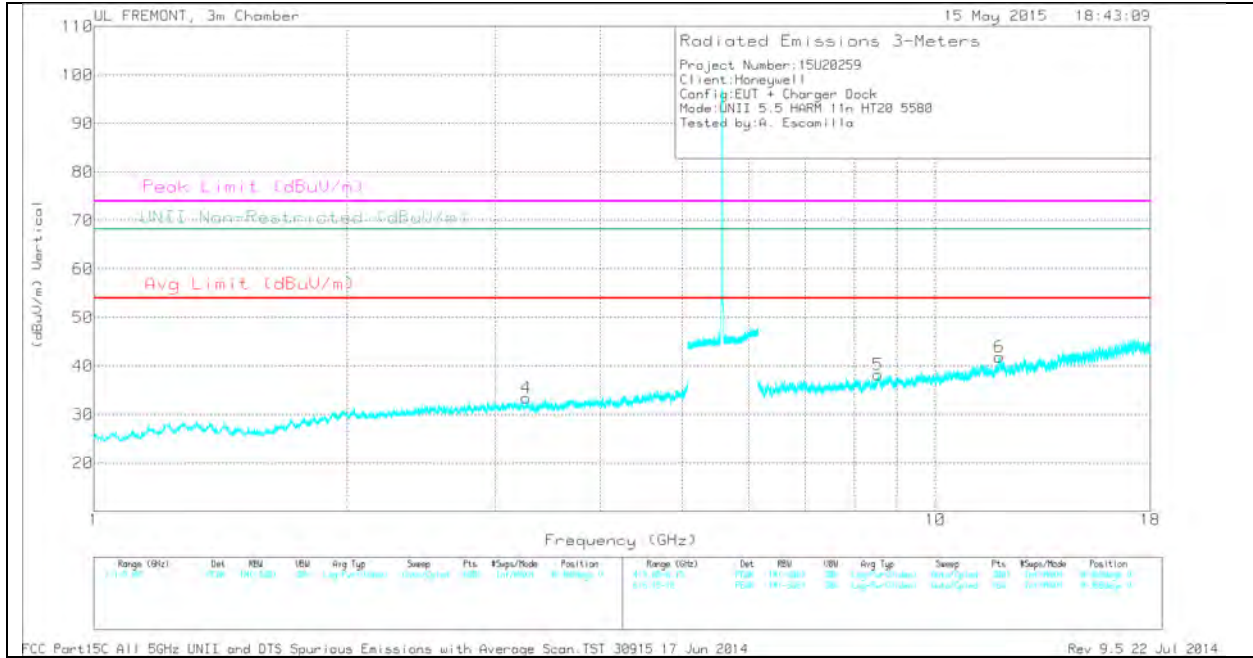
PK - Peak detector

MID CHANNEL HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

MID CHANNEL VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

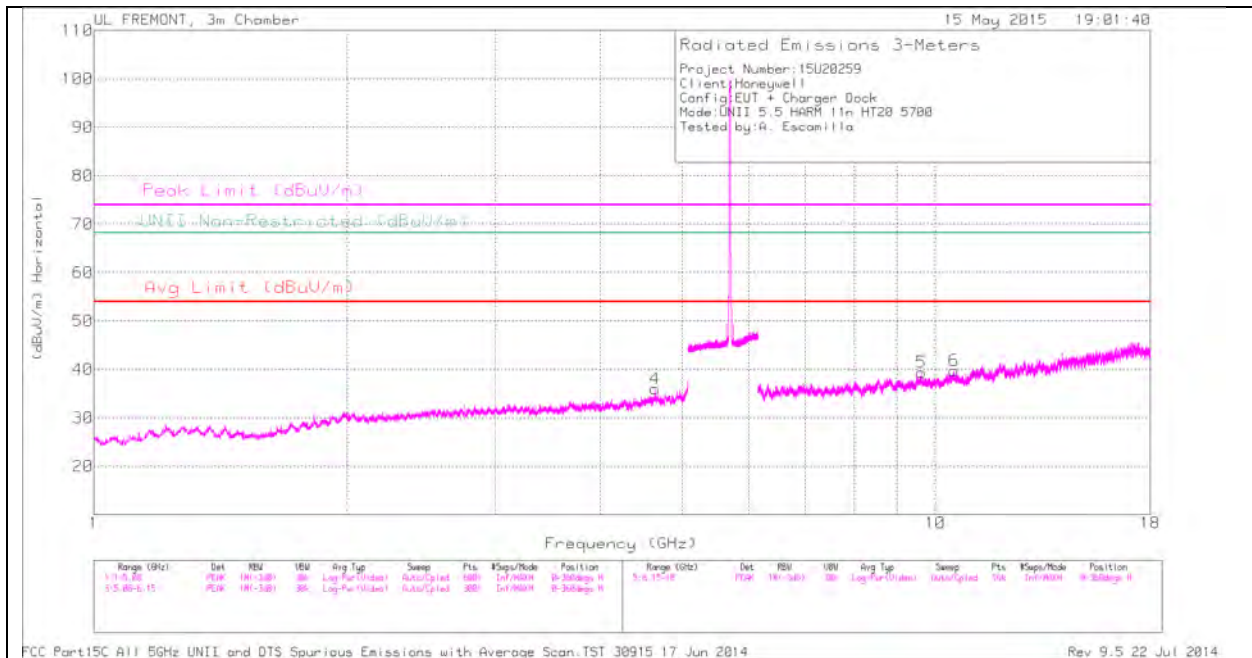
MID CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Chl/ Fitr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.926	32.62	PK	31.2	-32.5	0	31.32	-	-	-	-	68.2	-36.88	0-360	100	H
4	3.262	32.52	PK	32.6	-31.7	0	33.42	-	-	74	-40.58	-	-	0-360	100	V
2	7.835	29.8	PK	35.8	-27.8	0	37.8	-	-	-	-	68.2	-30.4	0-360	100	H
5	8.541	28.69	PK	35.8	-26.2	0	38.29	-	-	-	-	68.2	-29.91	0-360	100	V
6	11.918	28.97	PK	39.1	-26.2	0	41.87	-	-	74	-32.13	-	-	0-360	100	V
3	12.046	28.65	PK	39.1	-26.2	0	41.55	-	-	74	-32.45	-	-	0-360	100	H

PK - Peak detector

HIGH CHANNEL HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

MID CHANNEL DATA

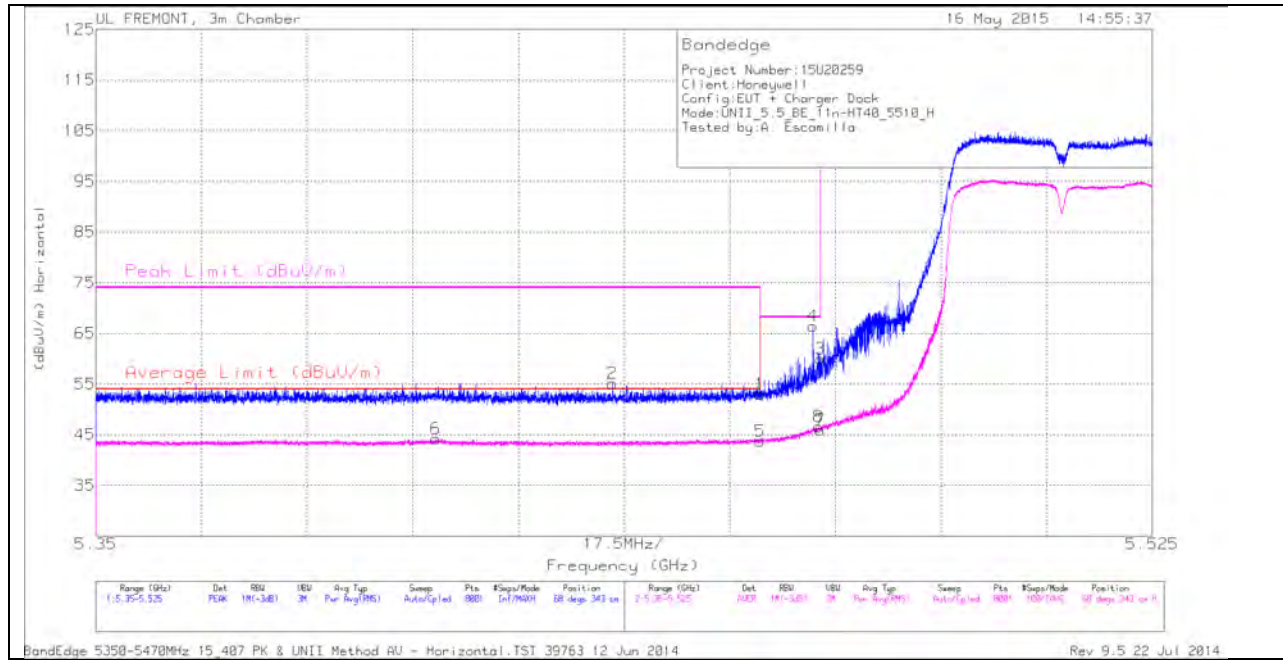
TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Chl/ Ftr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	4.588	32.74	PK	33.8	-30.5	0	36.04	-	-	74	-37.96	-	-	0-360	100	V
4	4.644	32.27	PK	33.9	-30.2	0	35.97	-	-	74	-38.03	-	-	0-360	100	H
2	8.824	28.87	PK	35.9	-25.8	0	38.97	-	-	-	-	68.2	-29.23	0-360	200	V
5	9.623	28.05	PK	36.7	-25.4	0	39.35	-	-	-	-	68.2	-28.85	0-360	100	H
6	10.522	27.33	PK	37.5	-25	0	39.83	-	-	-	-	68.2	-28.37	0-360	100	H
3	12.777	29.19	PK	39.1	-25.9	0	42.39	-	-	-	-	68.2	-25.81	0-360	100	V

PK - Peak detector

11.3.3. TX ABOVE 1 GHz 802.11n HT40 MODE IN THE 5.5 GHz BAND RESTRICTED BANDEDGE (LOW CHANNEL)

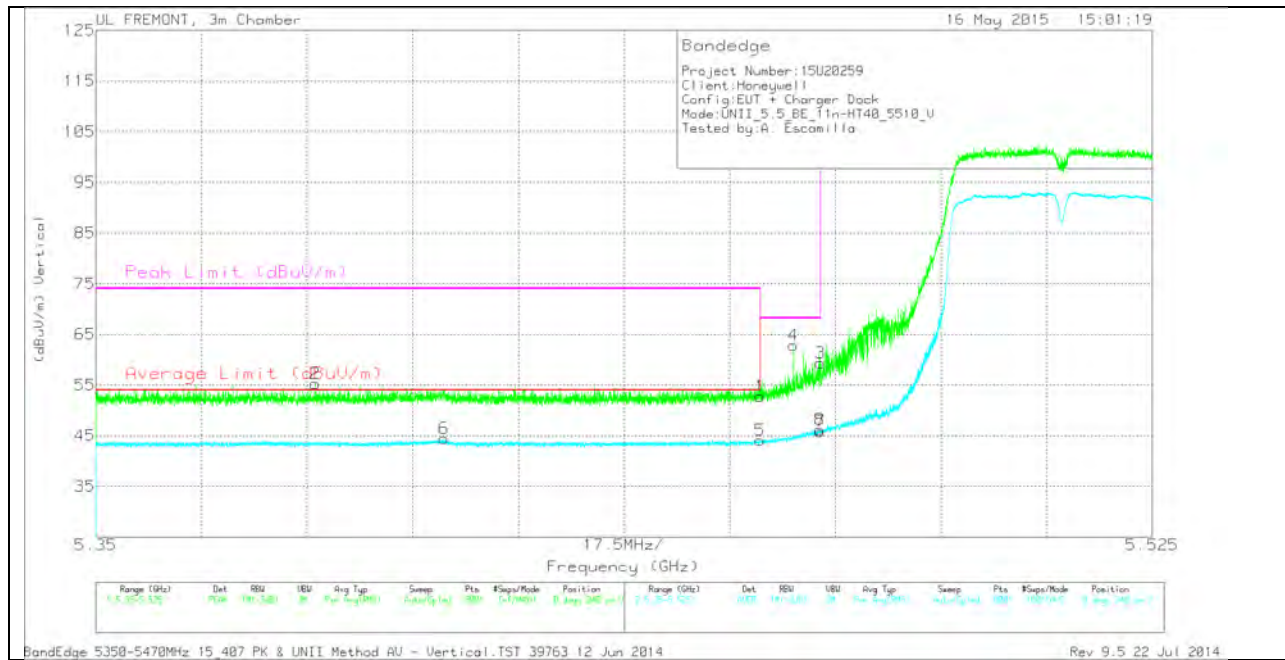
HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Filt r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
6	5.406	30.47	RMS	34.6	-21.4	.5	44.17	54	-9.83	-	-	68	343	H
2	5.436	41.93	PK	34.6	-21.4	0	55.13	-	-	74	-18.87	68	343	H
1	5.46	39.85	PK	34.6	-21.4	0	53.05	-	-	74	-20.95	68	343	H
5	5.46	30.03	RMS	34.6	-21.4	.5	43.73	54	-10.27	-	-	68	343	H
4	5.469	53.17	PK	34.6	-21.3	0	66.47	-	-	68.2	-1.73	68	343	H
3	5.47	46.68	PK	34.6	-21.3	0	59.98	-	-	68.2	-8.22	68	343	H
7	5.47	32.1	RMS	34.6	-21.3	.5	45.9	-	-	-	-	68	343	H
8	5.47	32.73	RMS	34.6	-21.3	.5	46.53	-	-	-	-	68	343	H

VERTICAL PEAK AND AVERAGE PLOT

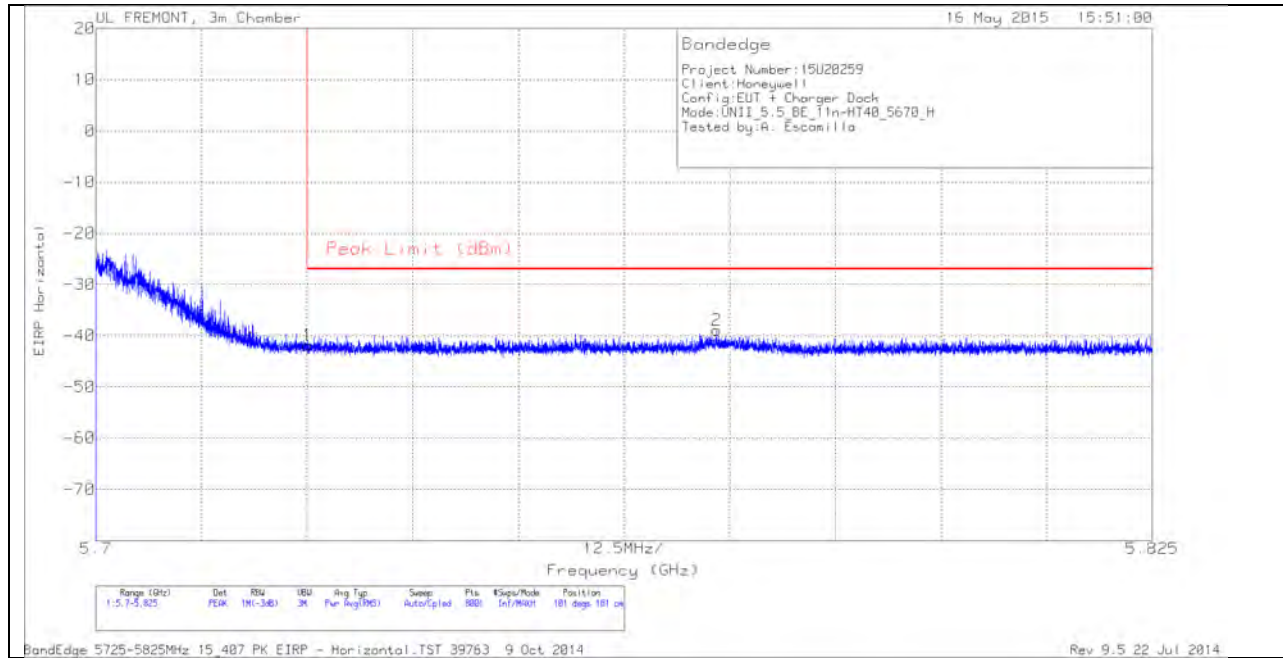


VERTICAL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Ftr r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	5.386	42.09	PK	34.6	-21.4	0	55.29	-	-	74	-18.71	0	240	V
6	5.408	30.72	RMS	34.6	-21.4	.5	44.42	54	-9.58	-	-	0	240	V
1	5.46	39.53	PK	34.6	-21.4	0	52.73	-	-	74	-21.27	0	240	V
5	5.46	30.38	RMS	34.6	-21.4	.5	44.08	54	-9.92	-	-	0	240	V
4	5.466	49.48	PK	34.6	-21.3	0	62.78	-	-	68.2	-5.42	0	240	V
3	5.47	46.1	PK	34.6	-21.3	0	59.4	-	-	68.2	-8.8	0	240	V
7	5.47	32.03	RMS	34.6	-21.3	.5	45.83	-	-	-	-	0	240	V
8	5.47	32.36	RMS	34.6	-21.3	.5	46.16	-	-	-	-	0	240	V

AUTHORIZED BANDEDGE (HIGH CHANNEL)

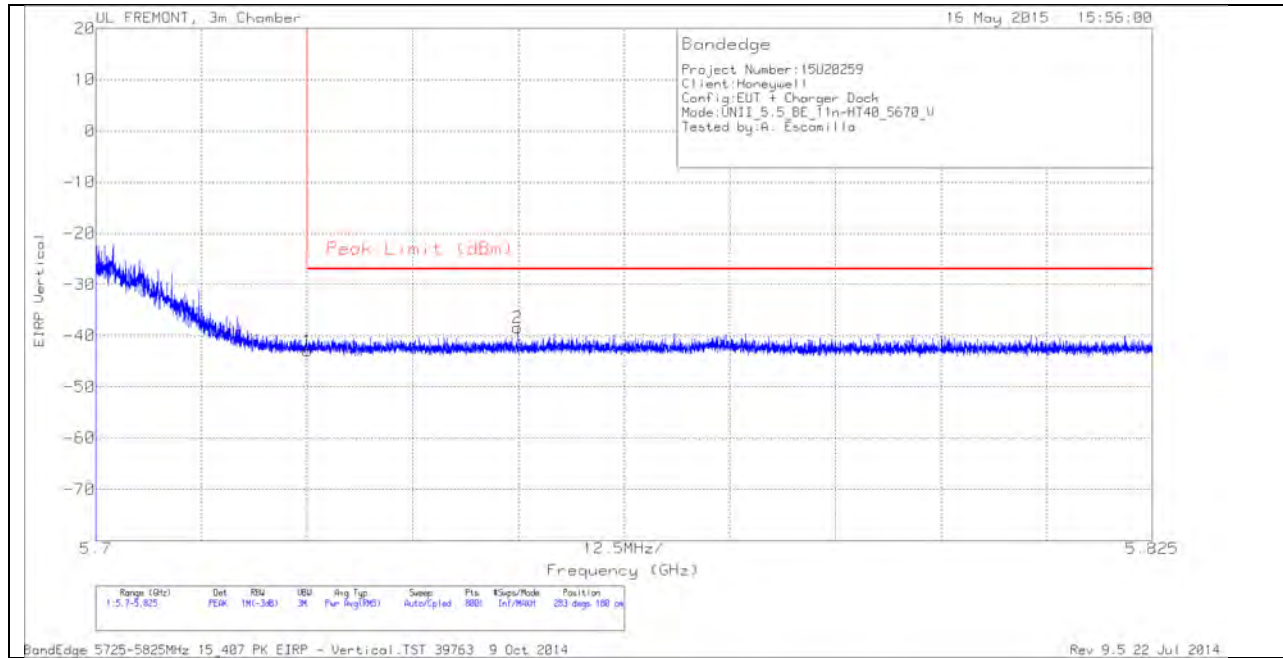
HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T119 (dB/m)	Amp/Cbl/F ltr/Pad (dB)	Conversion Factor (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.725	-67.4	PK	34.8	-21.1	11.8	-41.9	-27	-14.9	101	181	H
2	5.773	-64.18	PK	34.8	-21.3	11.8	-38.88	-27	-11.88	101	181	H

VERTICAL PEAK AND AVERAGE PLOT

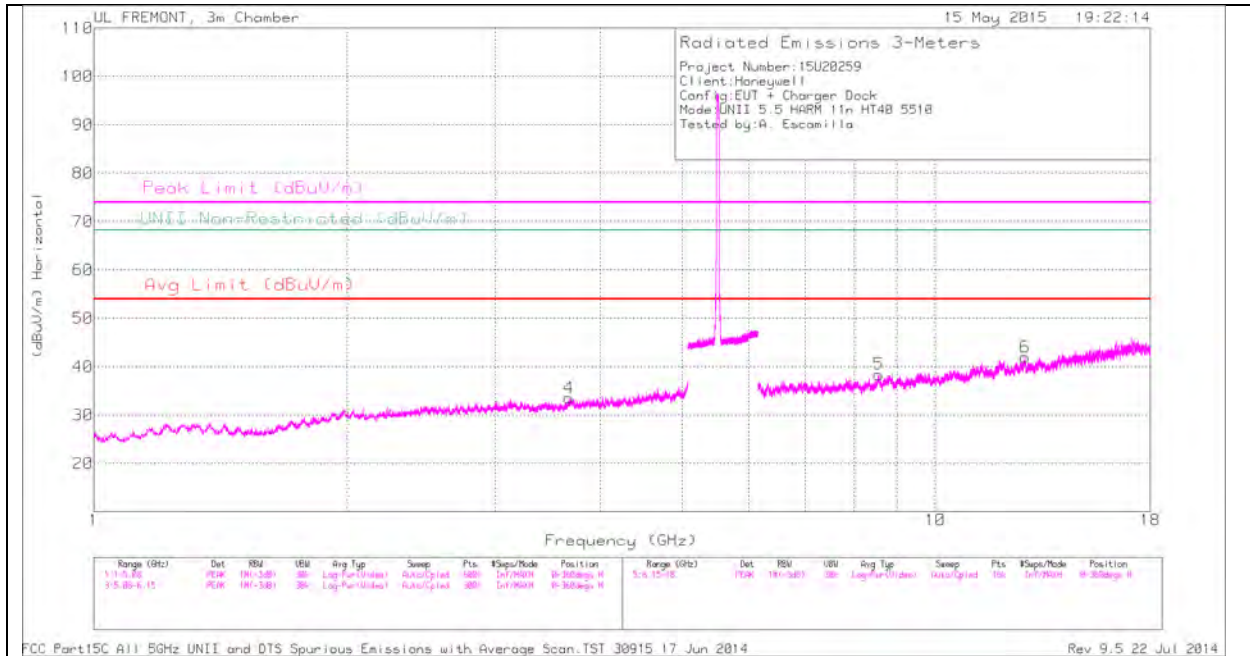


VERTICAL DATA

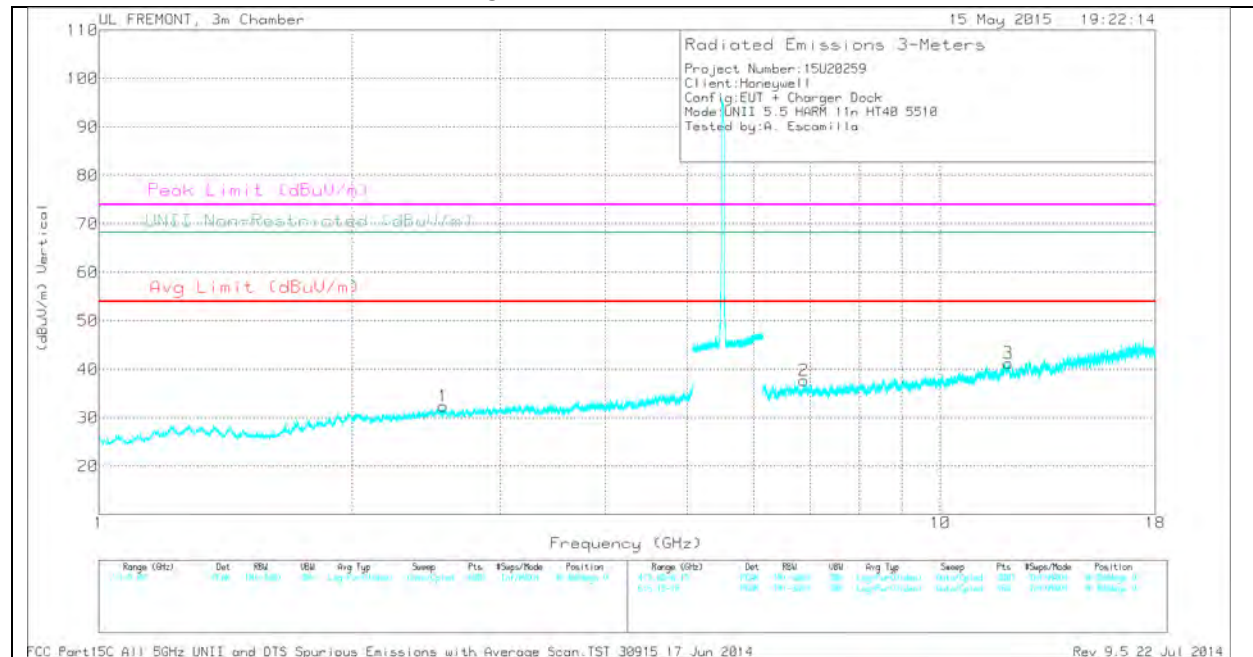
Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T119 (dB/m)	Amp/Cbl/F ltr/Pad (dB)	Conversion Factor (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.725	-68.48	PK	34.8	-21.1	11.8	-42.98	-27	-15.98	283	180	V
2	5.75	-63.83	PK	34.8	-21.2	11.8	-38.43	-27	-11.43	283	180	V

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.



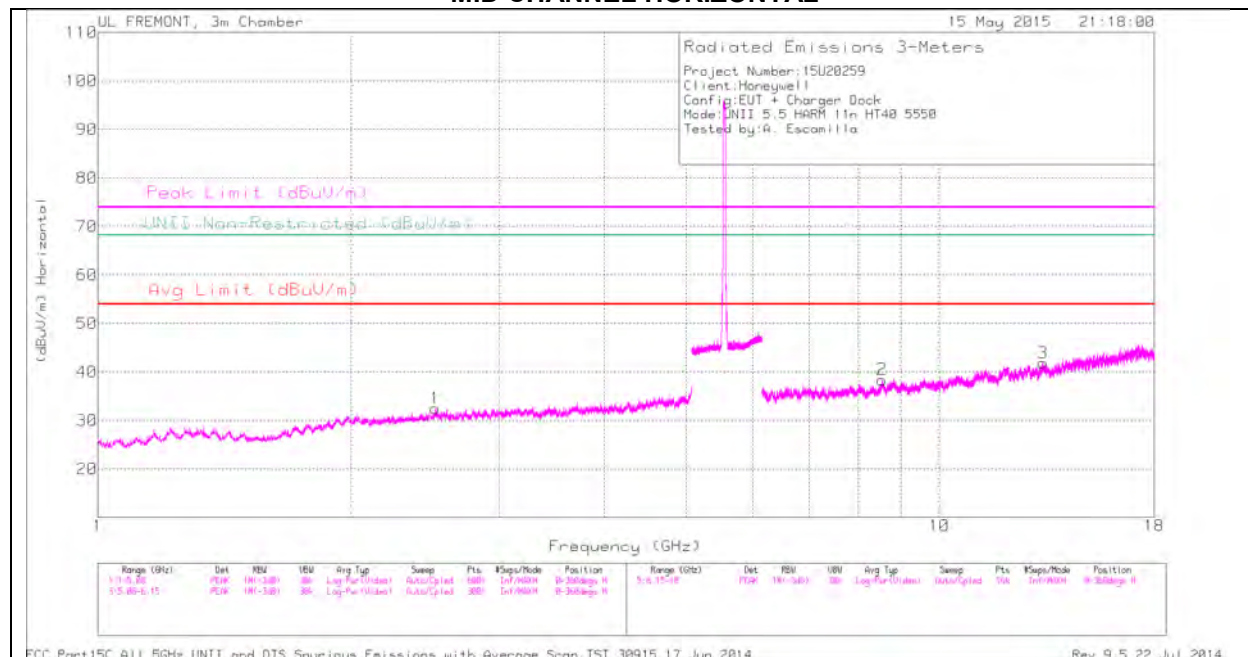
LOW CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/ Ftr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.565	32.21	PK	32.4	-32.2	0	32.41	-	-	-	-	68.2	-35.79	0-360	100	V
4	3.671	31.21	PK	32.9	-30.6	0	33.51	-	-	74	-40.49	-	-	0-360	200	H
2	6.881	31.46	PK	35.6	-29.4	0	37.66	-	-	-	-	68.2	-30.54	0-360	200	V
5	8.566	28.83	PK	35.8	-26.2	0	38.43	-	-	-	-	68.2	-29.77	0-360	100	H
3	12.03	28.28	PK	39.1	-26.1	0	41.28	-	-	74	-32.72	-	-	0-360	200	V
6	12.783	28.73	PK	39.1	-25.8	0	42.03	-	-	-	-	68.2	-26.17	0-360	100	H

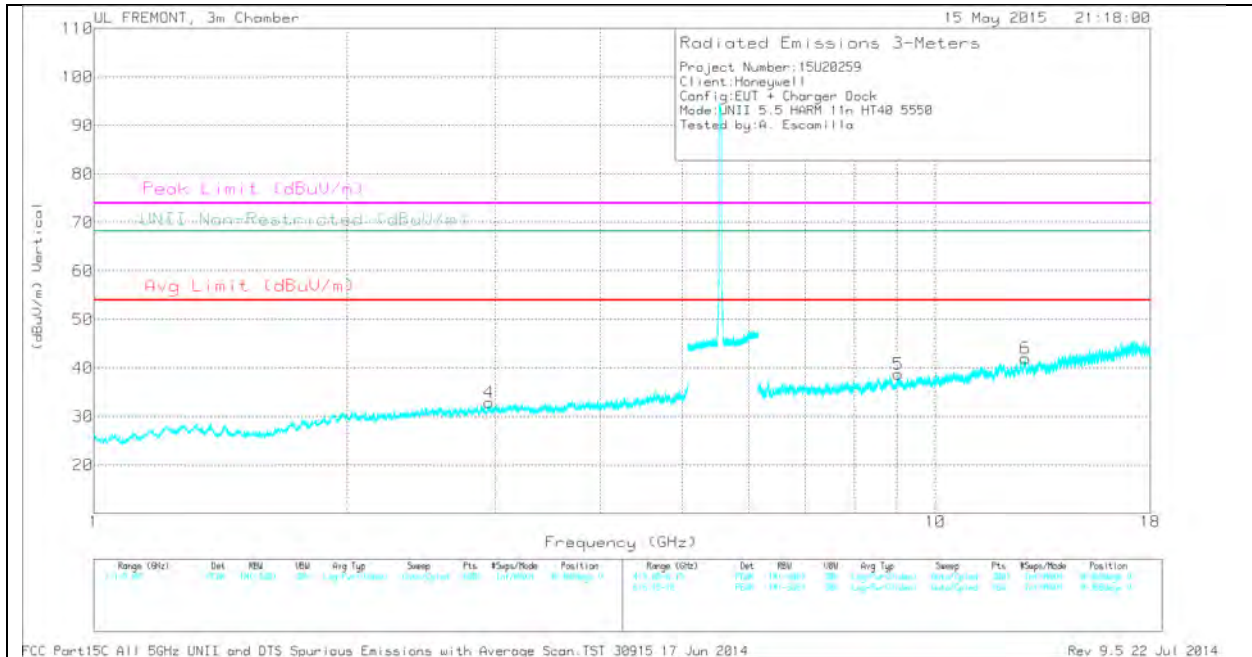
PK - Peak detector

MID CHANNEL HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

MID CHANNEL VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

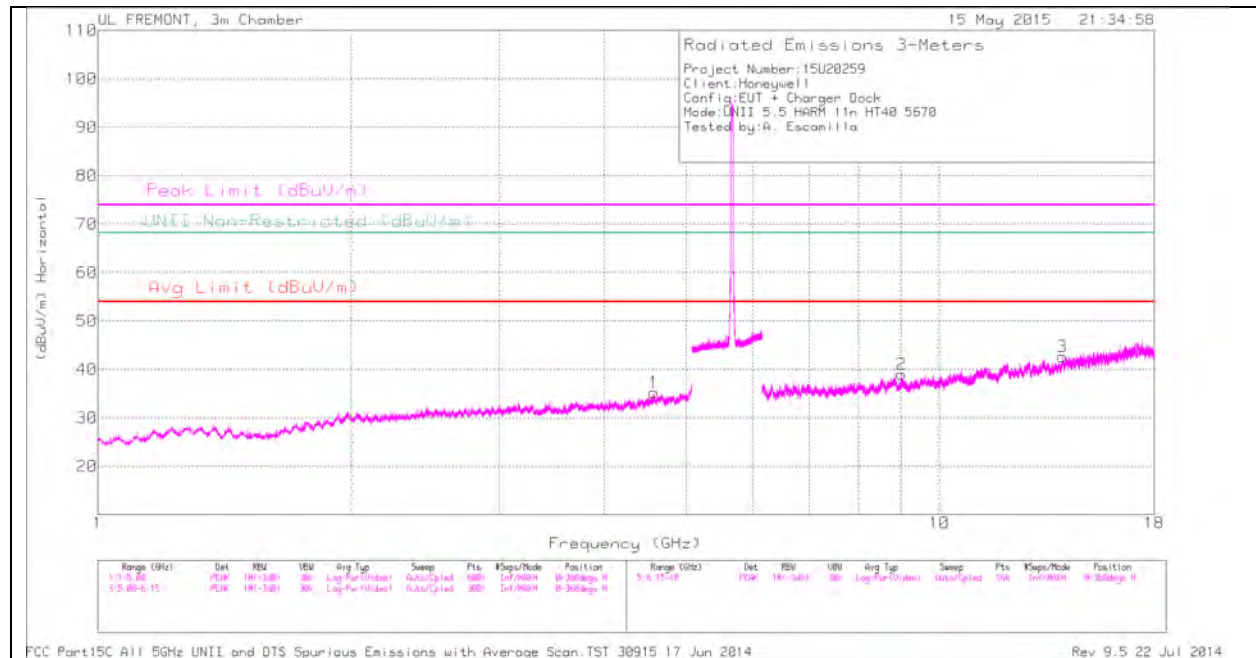
MID CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Chl/ Ftr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.519	32.4	PK	32.3	-32.2	0	32.5	-	-	-	-	68.2	-35.7	0-360	200	H
4	2.949	32.18	PK	32.7	-32	0	32.88	-	-	-	-	68.2	-35.32	0-360	200	V
2	8.544	28.73	PK	35.8	-26.1	0	38.43	-	-	-	-	68.2	-29.77	0-360	200	H
5	9.035	28.02	PK	36.1	-25.4	0	38.72	-	-	74	-35.28	-	-	0-360	100	V
6	12.792	28.75	PK	39.1	-25.9	0	41.95	-	-	-	-	68.2	-26.25	0-360	100	V
3	13.263	29.17	PK	39	-26.3	0	41.87	-	-	74	-32.13	-	-	0-360	100	H

PK - Peak detector

HIGH CHANNEL HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

HIGH CHANNEL DATA

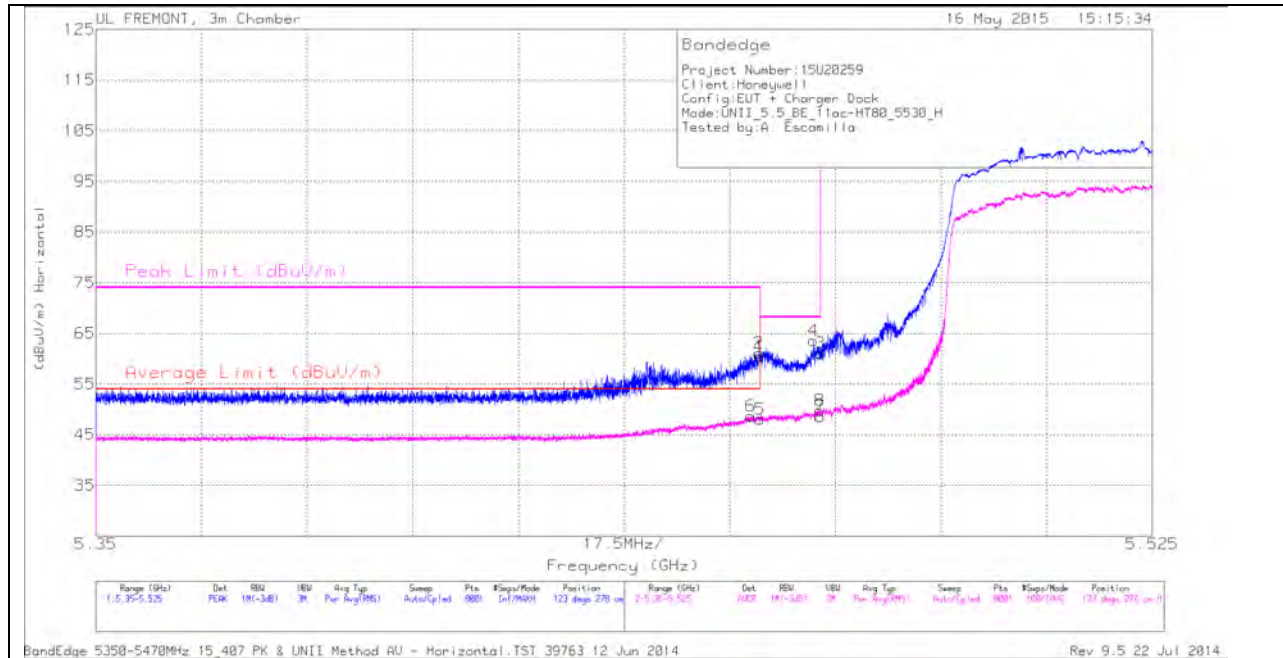
TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	3.137	32.64	PK	32.7	-31.8	0	33.54	-	-	-	-	68.2	-34.66	0-360	200	V
1	4.577	32.2	PK	33.8	-30.7	0	35.3	-	-	74	-38.7	-	-	0-360	100	H
5	7.421	30.98	PK	35.7	-28.7	0	37.98	-	-	74	-36.02	-	-	0-360	100	V
2	9.021	28.64	PK	36	-25.6	0	39.04	-	-	74	-34.96	-	-	0-360	100	H
6	12.494	28.66	PK	39	-26.5	0	41.16	-	-	74	-32.84	-	-	0-360	100	V
3	14.006	31.58	PK	38.8	-27.7	0	42.68	-	-	-	-	68.2	-25.52	0-360	100	H

PK - Peak detector

11.3.4. TX ABOVE 1 GHz 802.11ac HT80 MODE IN THE 5.5 GHz BAND RESTRICTED BANDEDGE (LOW CHANNEL)

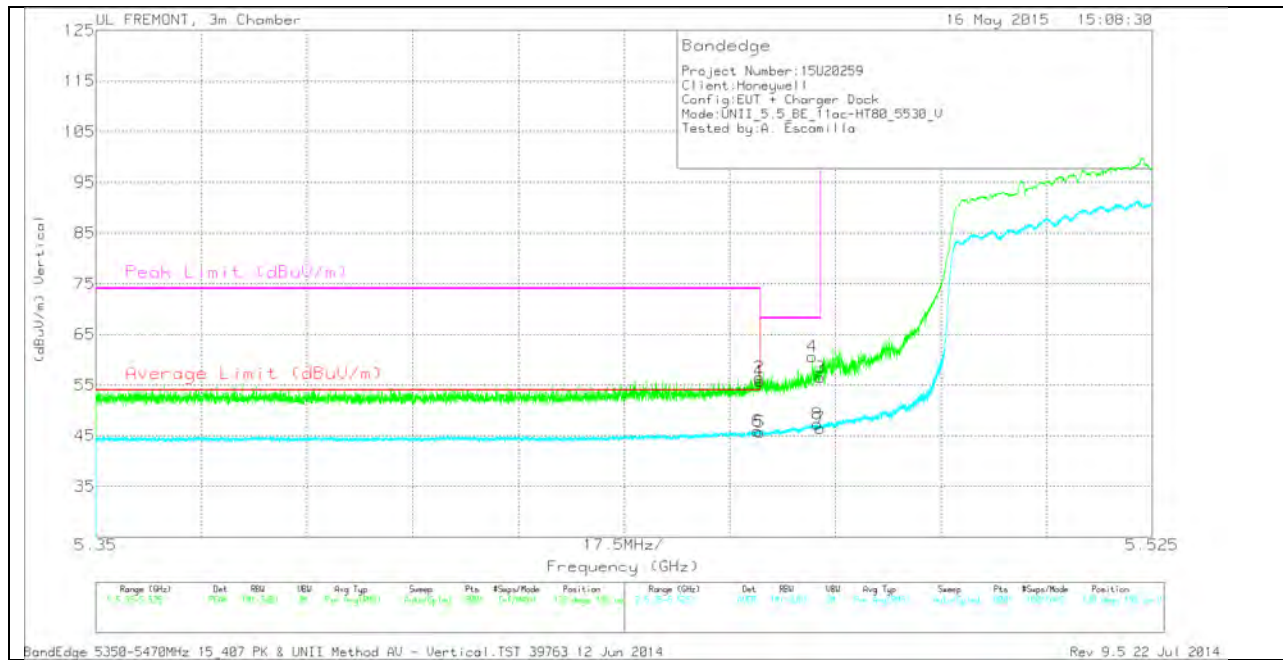
HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Filt r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
6	5.458	34.01	RMS	34.6	-21.4	1.47	48.68	54	-5.32	-	-	123	278	H
1	5.46	47.3	PK	34.6	-21.4	0	60.5	-	-	74	-13.5	123	278	H
2	5.46	47.91	PK	34.6	-21.4	0	61.11	-	-	74	-12.89	123	278	H
5	5.46	33.37	RMS	34.6	-21.4	1.47	48.04	54	-5.96	-	-	123	278	H
4	5.469	50.29	PK	34.6	-21.3	0	63.59	-	-	68.2	-4.61	123	278	H
3	5.47	47.8	PK	34.6	-21.3	0	61.1	-	-	68.2	-7.1	123	278	H
7	5.47	33.81	RMS	34.6	-21.3	1.47	48.58	-	-	-	-	123	278	H
8	5.47	34.99	RMS	34.6	-21.3	1.47	49.76	-	-	-	-	123	278	H

VERTICAL PEAK AND AVERAGE PLOT

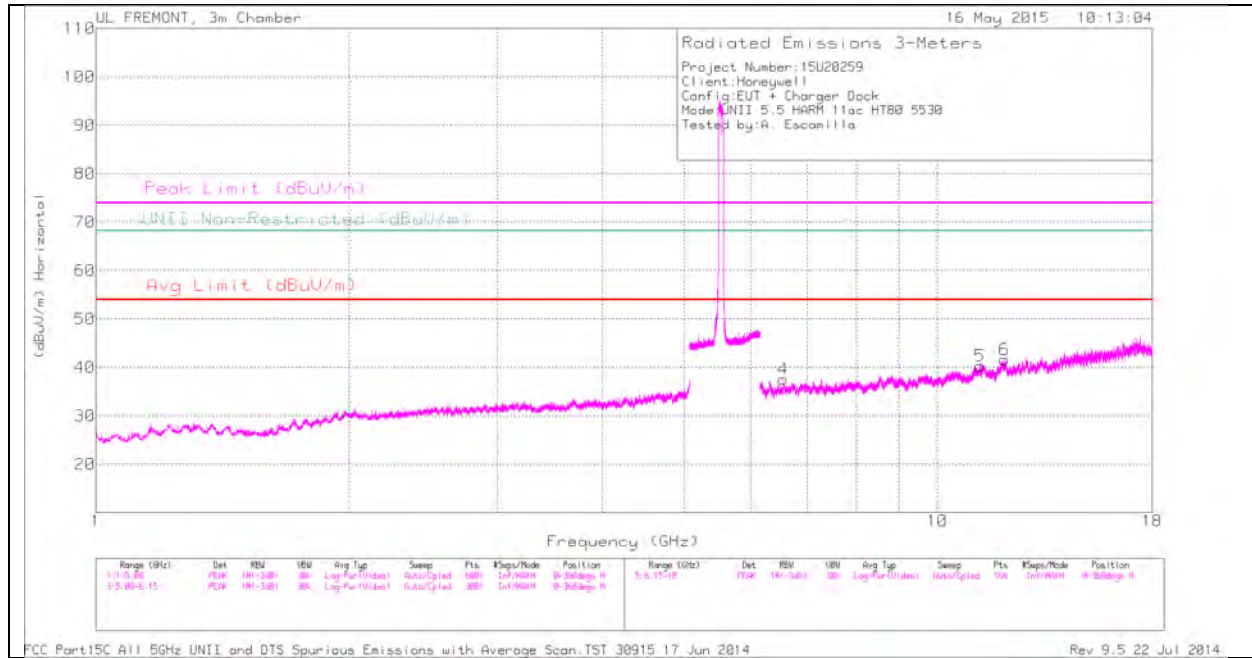


VERTICAL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Ftr r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.46	42.61	PK	34.6	-21.4	0	55.81	-	-	74	-18.19	138	196	V
2	5.46	43.34	PK	34.6	-21.4	0	56.54	-	-	74	-17.46	138	196	V
5	5.46	31.07	RMS	34.6	-21.4	1.47	45.74	54	-8.26	-	-	138	196	V
6	5.46	31.3	RMS	34.6	-21.4	1.47	45.97	54	-8.03	-	-	138	196	V
4	5.469	47.28	PK	34.6	-21.3	0	60.58	-	-	68.2	-7.62	138	196	V
8	5.469	32.5	RMS	34.6	-21.3	1.47	47.27	-	-	-	-	138	196	V
3	5.47	43.19	PK	34.6	-21.3	0	56.49	-	-	68.2	-11.71	138	196	V
7	5.47	31.69	RMS	34.6	-21.3	1.47	46.46	-	-	-	-	138	196	V

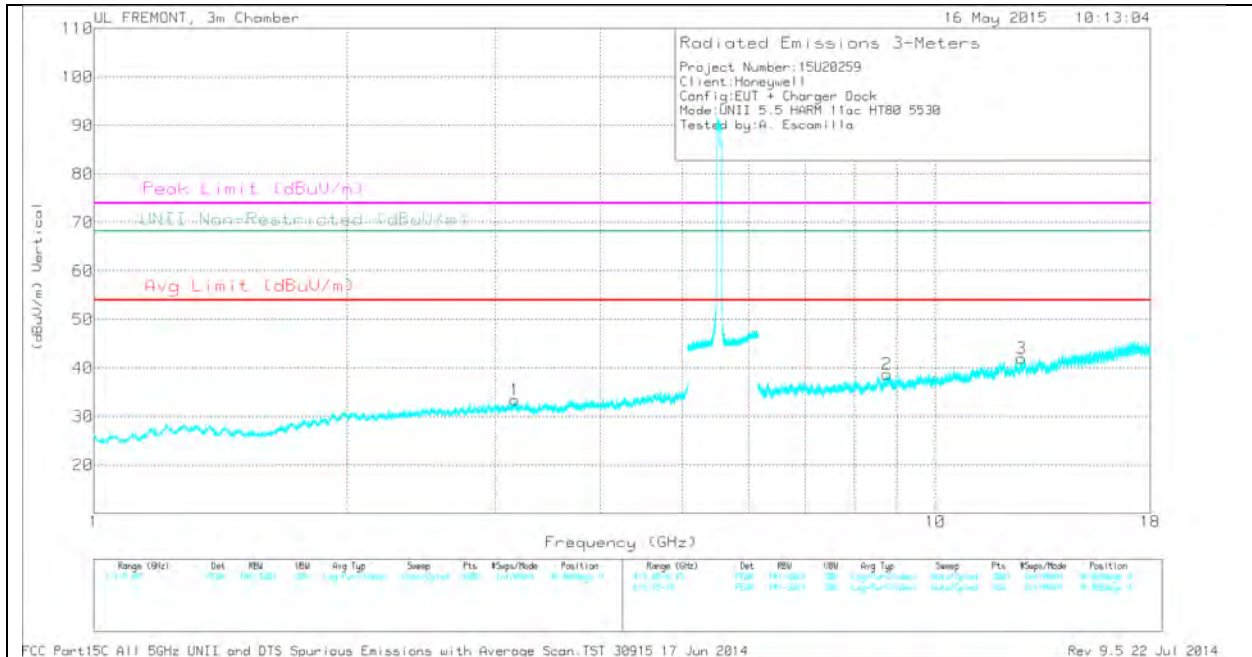
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

LOW CHANNEL VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

LOW CHANNEL DATA

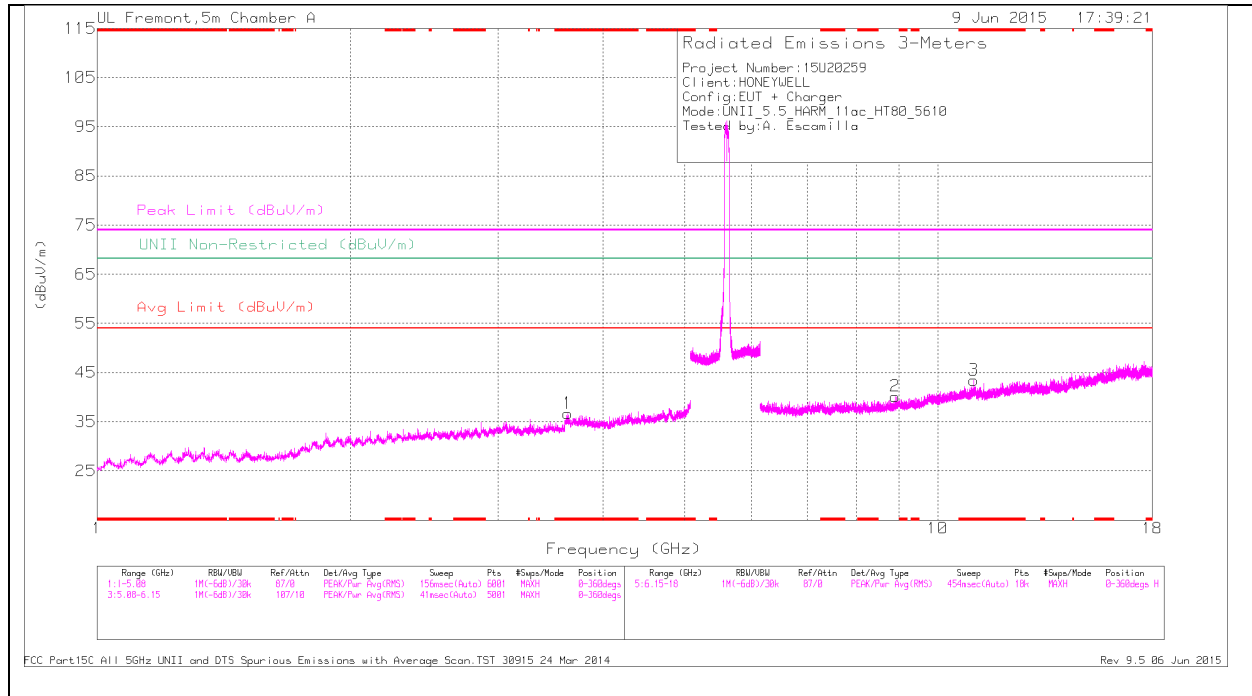
TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Chl/Filt /Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	3.165	32.27	PK	32.7	-31.5	33.47	-	-	-	-	68.2	-34.73	0-360	100	V
4	6.563	31.54	PK	35.6	-29.5	37.64	-	-	-	-	68.2	-30.56	0-360	100	H
2	8.758	29.15	PK	35.9	-26.3	38.75	-	-	-	-	68.2	-29.45	0-360	100	V
5	11.236	28.14	PK	38	-25.8	40.34	-	-	74	-33.66	-	-	0-360	100	H
6	12.016	28.63	PK	39.1	-26.1	41.63	-	-	74	-32.37	-	-	0-360	200	H
3	12.641	29.91	PK	39.1	-27	42.01	-	-	74	-31.99	-	-	0-360	200	V

PK - Peak detector

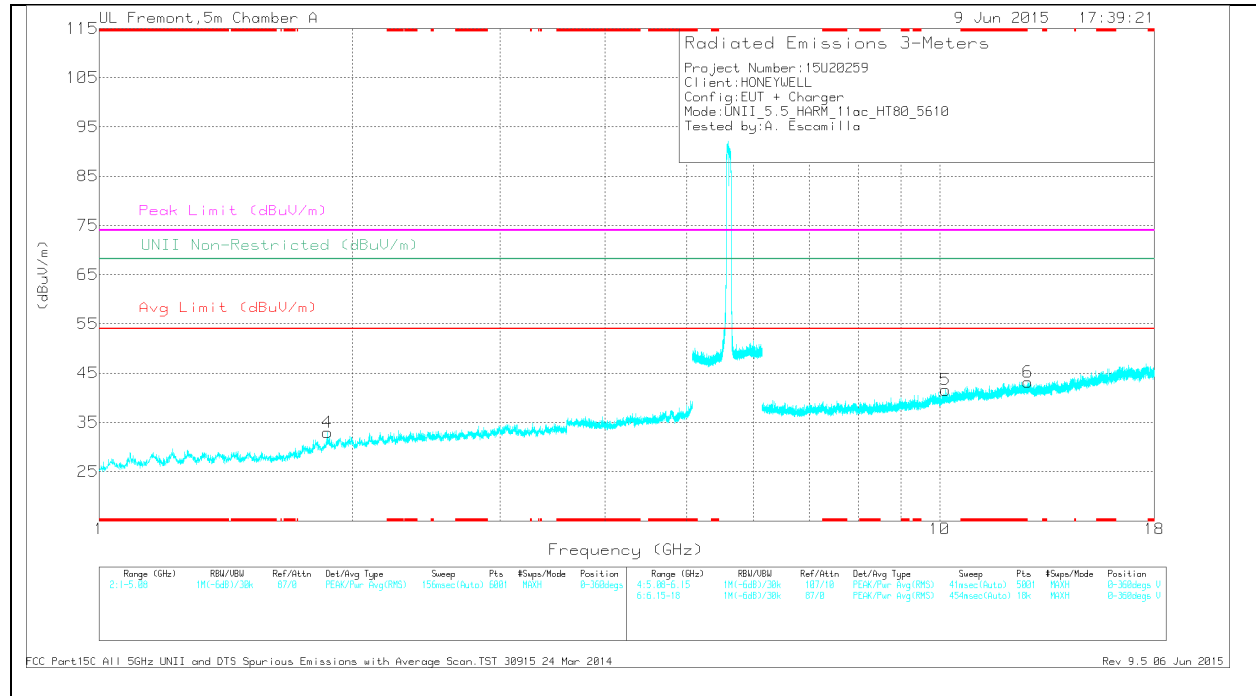
HARMONICS AND SPURIOUS EMISSIONS

HIGH CHANNEL HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

HIGH CHANNEL VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

HIGH CHANNEL DATA

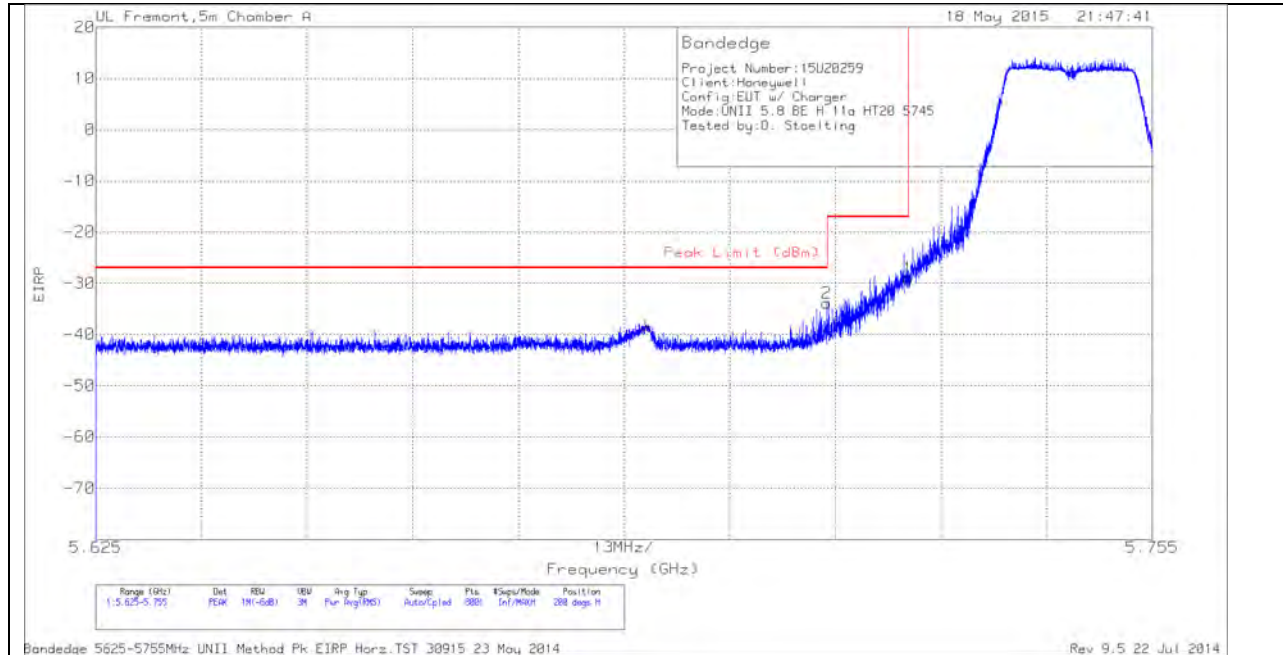
TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Chl/Fitr /Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 3.632	36.7	Pk	33.1	-33.1	36.7	-	-	74	-37.3	68.2	-31.5	0-360	100	H
3	* 11.04	28.68	Pk	37.9	-23.1	43.48	-	-	74	-30.52	68.2	-24.72	0-360	201	H
4	1.87	36.83	Pk	30.6	-34.5	32.93	-	-	74	-41.07	68.2	-35.27	0-360	100	V
2	8.904	29.97	Pk	36.1	-25.9	40.17	-	-	74	-33.83	68.2	-28.03	0-360	201	H
5	10.168	28.29	Pk	37.2	-23.9	41.59	-	-	74	-32.41	68.2	-26.61	0-360	200	V
6	12.741	26.97	Pk	39.2	-23	43.17	-	-	74	-30.83	68.2	-25.03	0-360	200	V

PK - Peak detector

11.4. 5.8 GHz

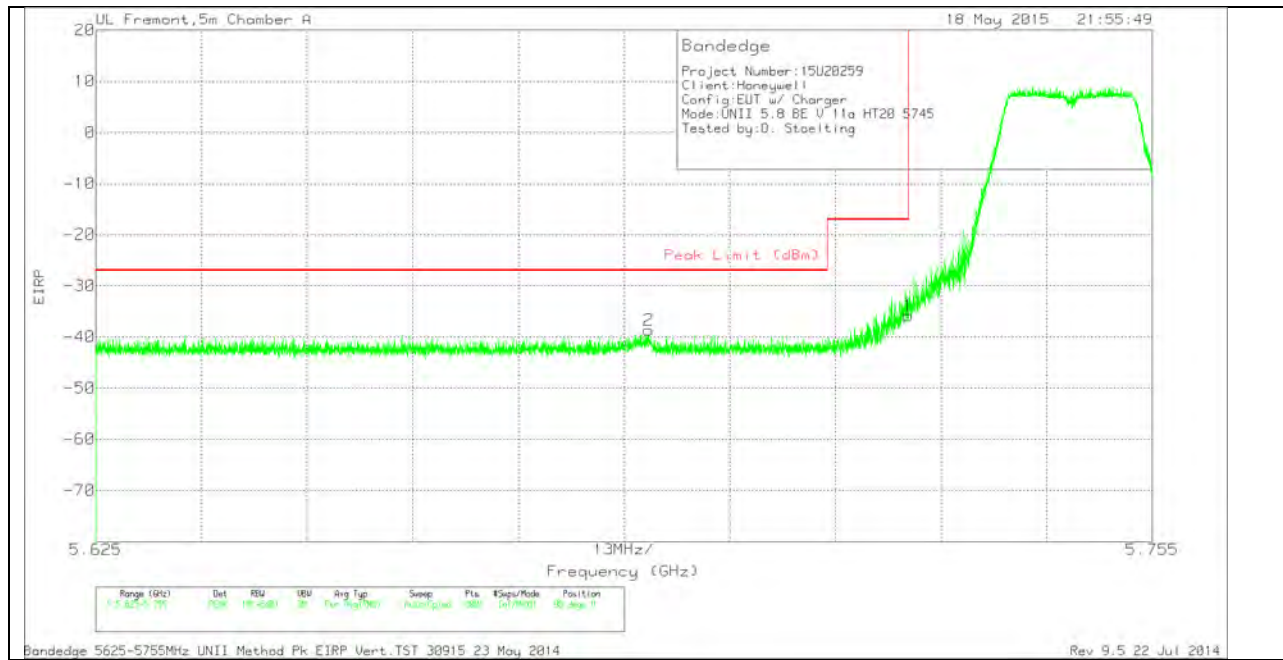
11.4.1. TX ABOVE 1 GHz 802.11a MODE IN THE 5.8 GHz BAND HARMONICS AND SPURIOUS EMISSIONS HORIZONTAL PEAK PLOT



HORIZONTAL DATA

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T136 (dB/m)	Amp/Cb/ Ftr/Pad (dB)	Conversion Factor (dB)	DC Corr (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	5.715	-59.69	PK	34.7	-20.7	11.8	0	-33.89	-27	-6.89	200	264	H
1	5.725	-54.77	PK	34.7	-20.7	11.8	0	-28.97	-17	-11.97	200	264	H

VERTICAL PEAK PLOT

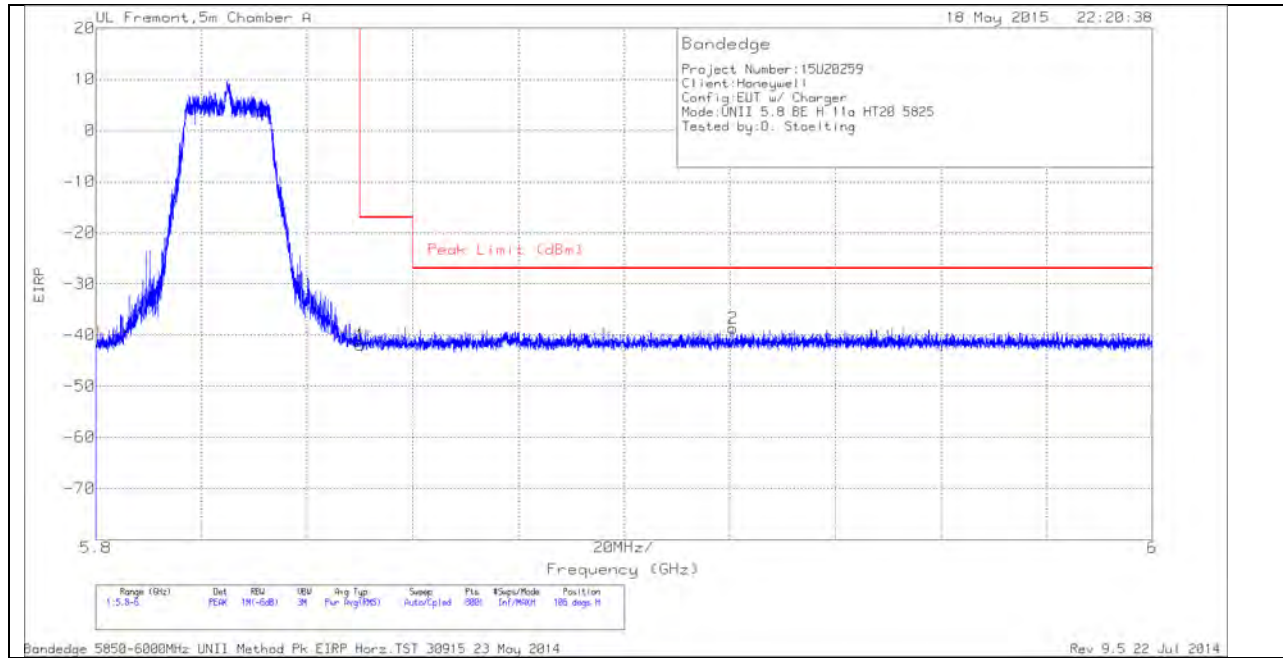


VERTICAL DATA

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AFT136 (dB/m)	Amp/Cbl/ Filt/Pad (dB)	Conversion Factor (dB)	DC Corr (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	5.693	-64.6	PK	34.7	-20.6	11.8	0	-38.7	-27	-11.7	98	215	V
1	5.725	-61.64	PK	34.7	-20.7	11.8	0	-35.84	-17	-18.84	98	215	V

AUTHORIZED BANDEGE (HIGH CHANNEL)

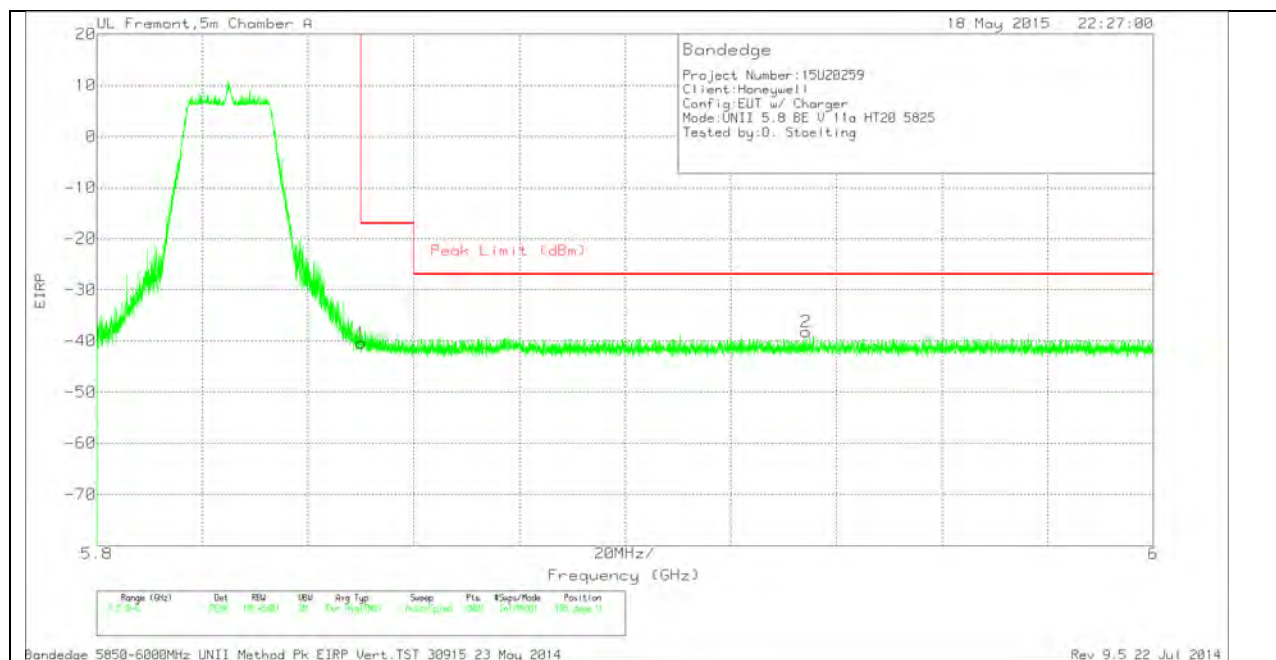
HORIZONTAL PEAK PLOT



HORIZONTAL DATA

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T136 (dB/m)	Amp/Cbl/ Ftr/Pad (dB)	Conversion Factor (dB)	DC Corr (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.85	-68.61	PK	35.1	-20.3	11.8	0	-42.01	-17	-25.01	106	283	H
2	5.921	-65.52	PK	35.2	-20.1	11.8	0	-38.62	-27	-11.62	106	283	H

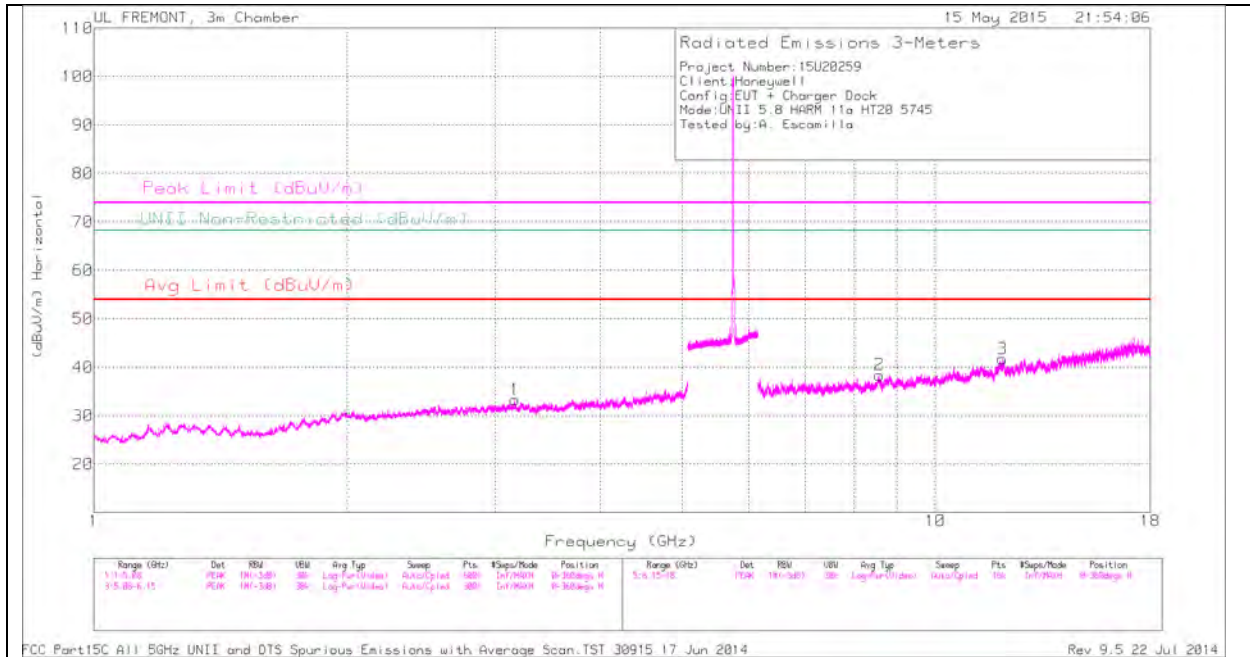
VERTICAL PEAK PLOT



VERTICAL DATA

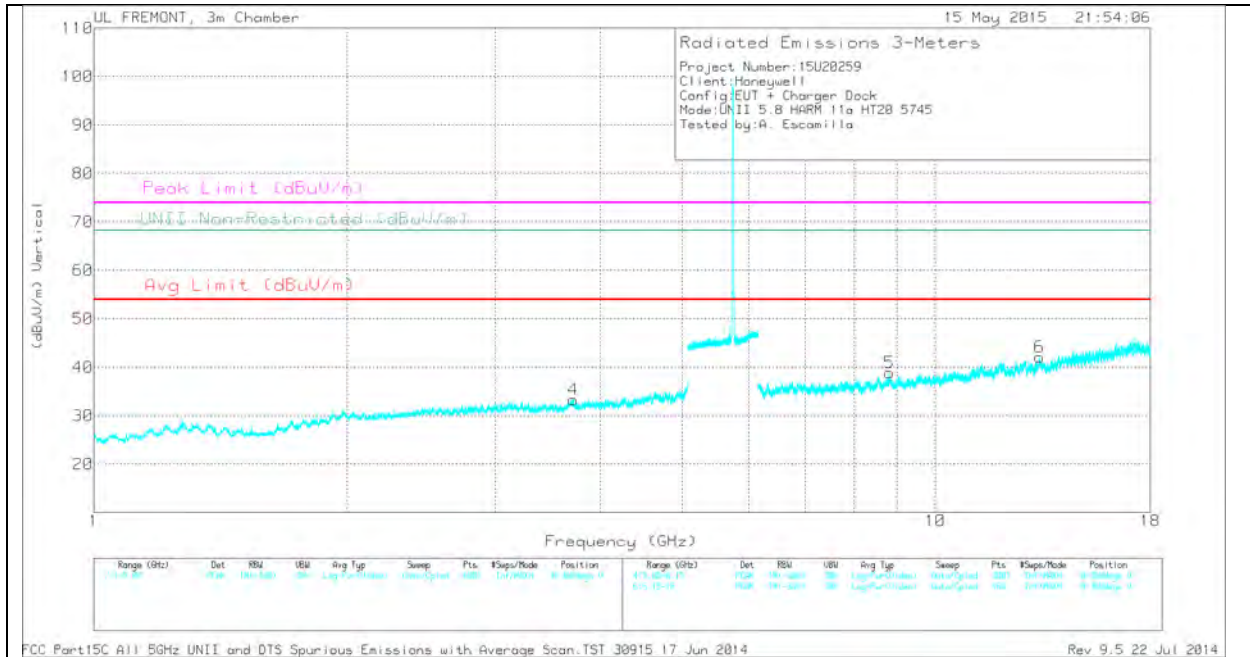
Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T136 (dB/m)	Amp/Cb/F ltr/Pad (dB)	Conversion Factor (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.85	-67.01	PK	35.1	-20.3	11.8	-40.41	-17	-23.41	106	260	V
2	5.934	-65.31	PK	35.2	-19.9	11.8	-38.21	-27	-11.21	106	260	V

LOW CHANNEL HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

LOW CHANNEL VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

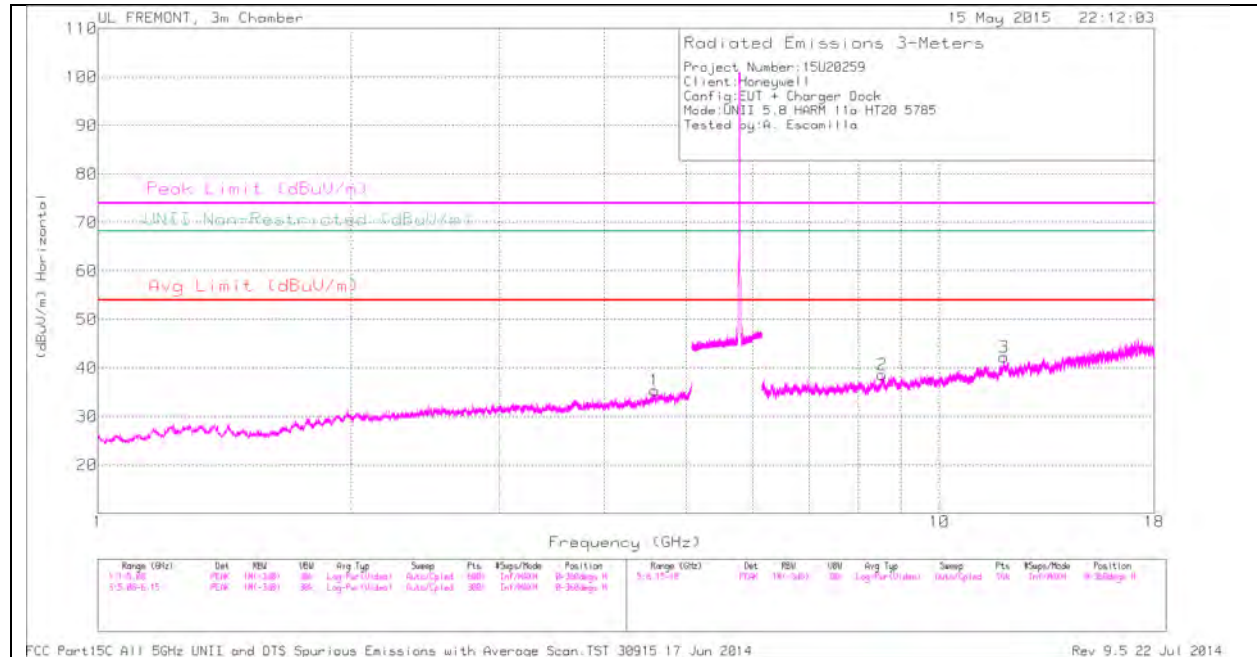
LOW CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Chl/ Ftr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	3.164	32.06	PK	32.7	-31.5	0	33.26	-	-	-	-	68.2	-34.94	0-360	200	H
4	3.71	31.09	PK	33	-30.8	0	33.29	-	-	74	-40.71	-	-	0-360	200	V
2	8.57	28.73	PK	35.8	-26.1	0	38.43	-	-	-	-	68.2	-29.77	0-360	100	H
5	8.818	28.64	PK	35.9	-25.6	0	38.94	-	-	-	-	68.2	-29.26	0-360	200	V
3	12.019	28.74	PK	39.1	-26.1	0	41.74	-	-	74	-32.26	-	-	0-360	100	H
6	13.288	29.61	PK	39	-26.5	0	42.11	-	-	74	-31.89	-	-	0-360	100	V

PK - Peak detector

MID CHANNEL HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

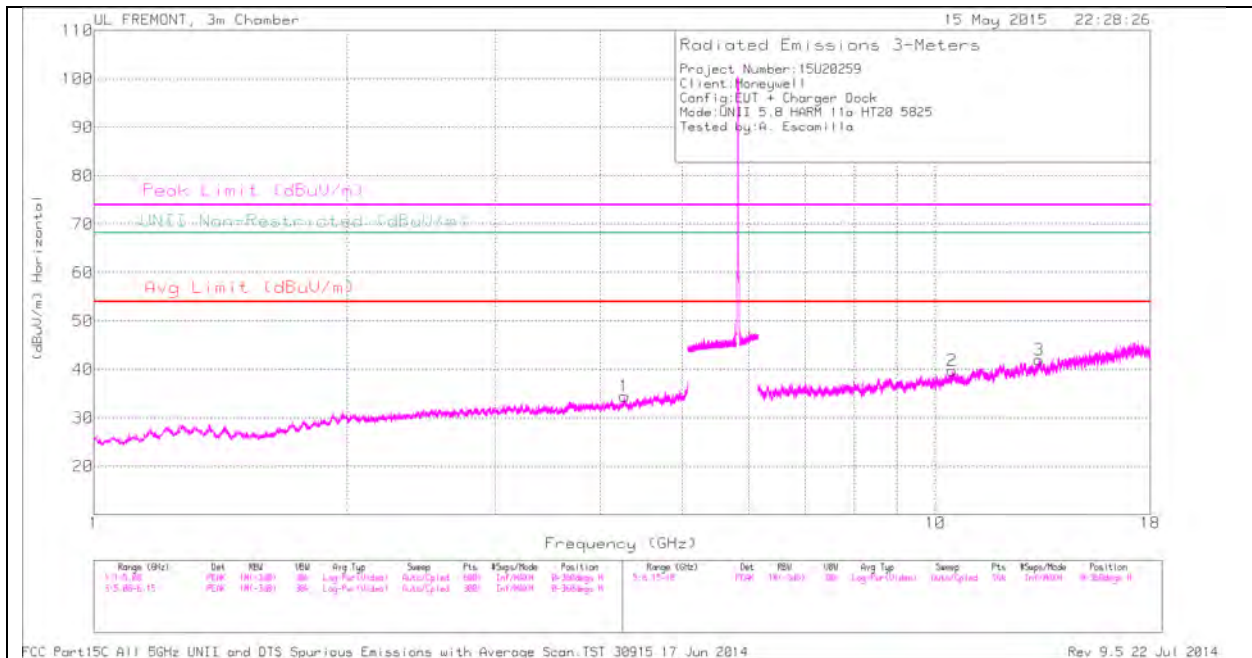
MID CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Chl/ Ftr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	2.094	32.72	PK	31.5	-32.7	0	31.52	-	-	-	-	68.2	-36.68	0-360	200	V
1	4.586	31.94	PK	33.8	-30.4	0	35.34	-	-	74	-38.66	-	-	0-360	100	H
2	8.541	29.02	PK	35.8	-26.2	0	38.62	-	-	-	-	68.2	-29.58	0-360	100	H
5	10.299	27.13	PK	37.1	-25	0	39.23	-	-	-	-	68.2	-28.97	0-360	200	V
3	11.931	29.37	PK	39.1	-26.2	0	42.27	-	-	74	-31.73	-	-	0-360	100	H
6	13.285	29.52	PK	39	-26.4	0	42.12	-	-	74	-31.88	-	-	0-360	100	V

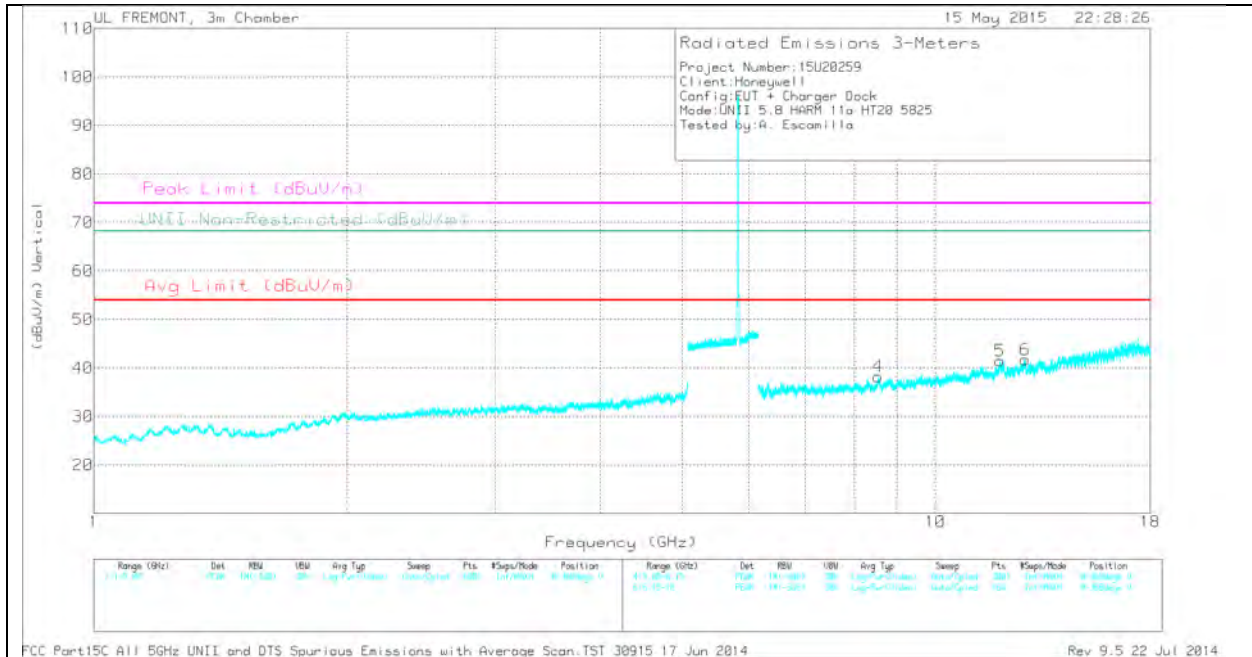
PK - Peak detector

HIGH CHANNEL HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

HIGH CHANNEL VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

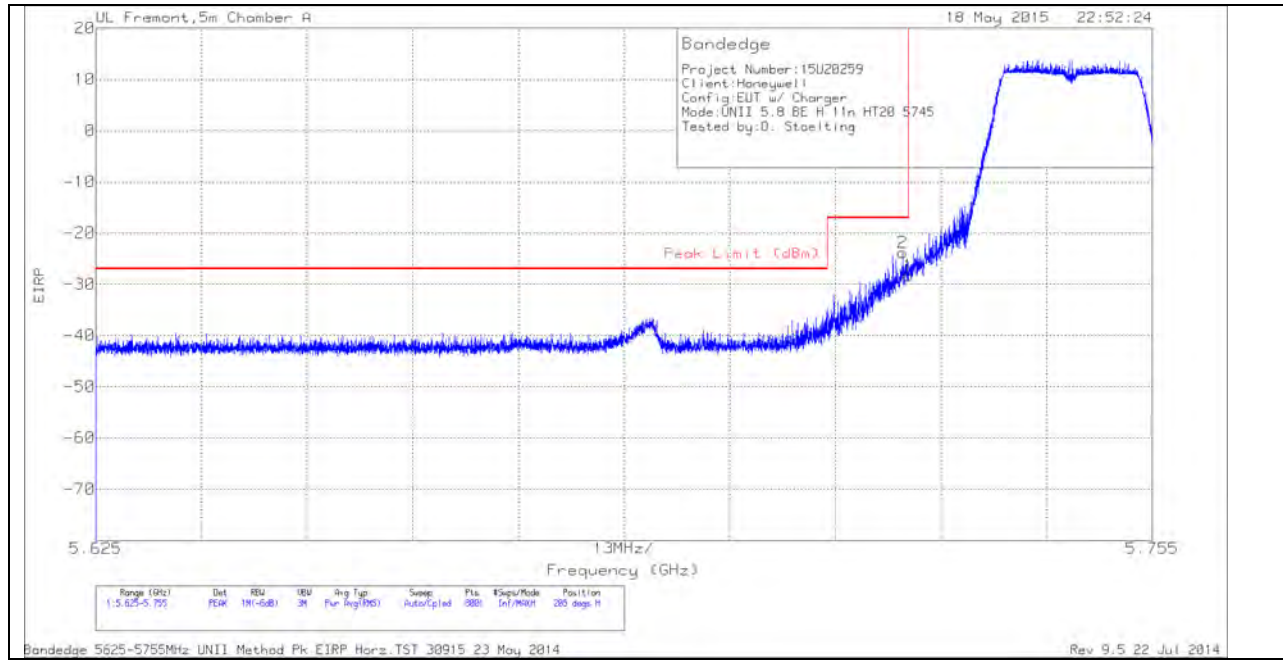
HIGH CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/ Ftr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	4.271	31.38	PK	33.4	-30.3	0	34.48	-	-	74	-39.52	-	-	0-360	100	H
4	8.545	28.38	PK	35.8	-26	0	38.18	-	-	-	-	68.2	-30.02	0-360	200	V
2	10.465	27.94	PK	37.4	-25.6	0	39.74	-	-	-	-	68.2	-28.46	0-360	100	H
5	11.928	28.59	PK	39.1	-26.2	0	41.49	-	-	74	-32.51	-	-	0-360	200	V
6	12.771	28.6	PK	39.1	-26	0	41.7	-	-	-	-	68.2	-26.5	0-360	100	V
3	13.274	29.15	PK	39	-26.1	0	42.05	-	-	74	-31.95	-	-	0-360	200	H

PK - Peak detector

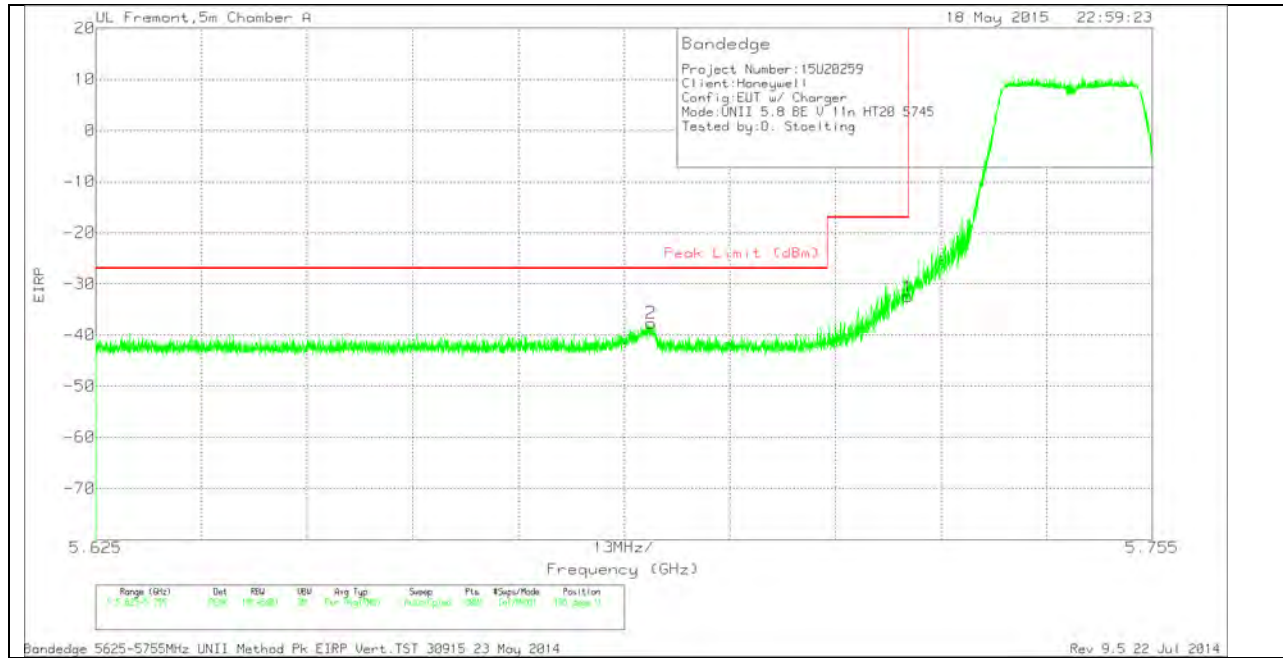
11.4.2. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.8 GHz BAND HARMONICS AND SPURIOUS EMISSIONS HORIZONTAL PEAK PLOT



HORIZONTAL DATA

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T136 (dB/m)	Amp/Cb/ Fitr/Pad (dB)	Conversion Factor (dB)	DC Corr (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	5.724	-49.62	PK	34.7	-20.7	11.8	0	-23.82	-17	-6.82	205	316	H
1	5.725	-54.18	PK	34.7	-20.7	11.8	0	-28.38	-17	-11.38	205	316	H

VERTICAL PEAK AND AVERAGE PLOT

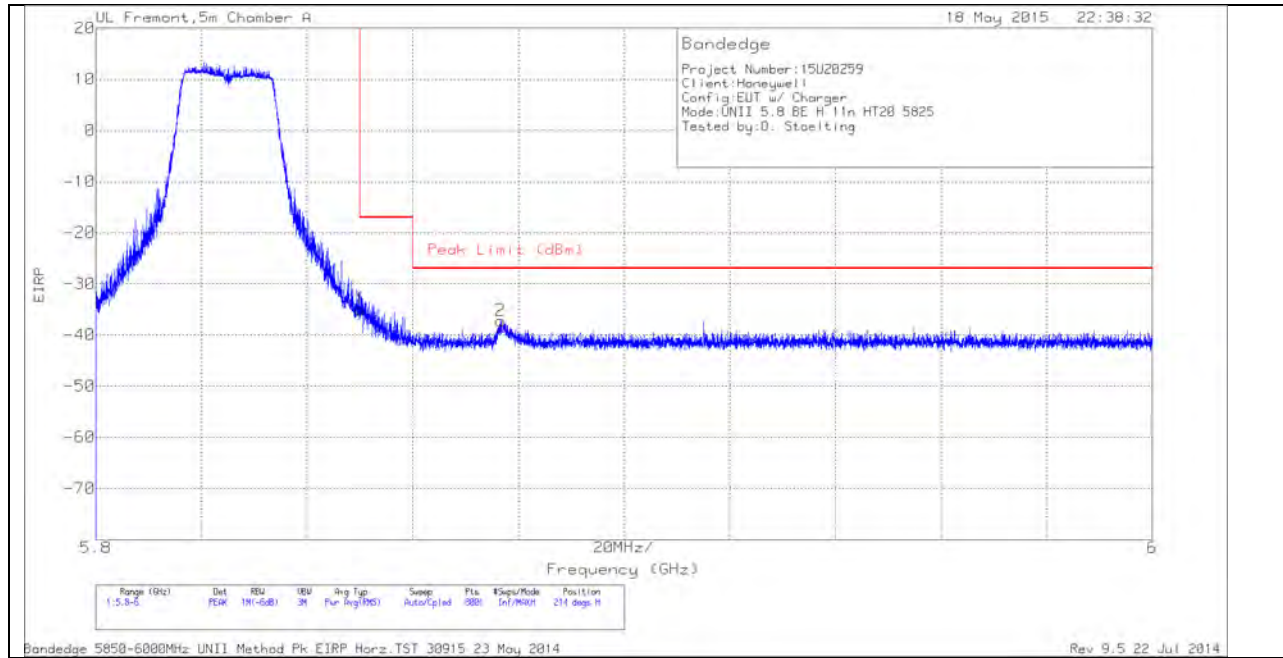


VERTICAL DATA

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T136 (dB/m)	Amp/Cbl/Ftr/Pad (dB)	Conversion Factor (dB)	DC Corr (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	5.693	-63.53	PK	34.7	-20.6	11.8	0	-37.63	-27	-10.63	105	242	V
1	5.725	-58.3	PK	34.7	-20.7	11.8	0	-32.5	-17	-15.5	105	242	V

AUTHORIZED BANDEGE (HIGH CHANNEL)

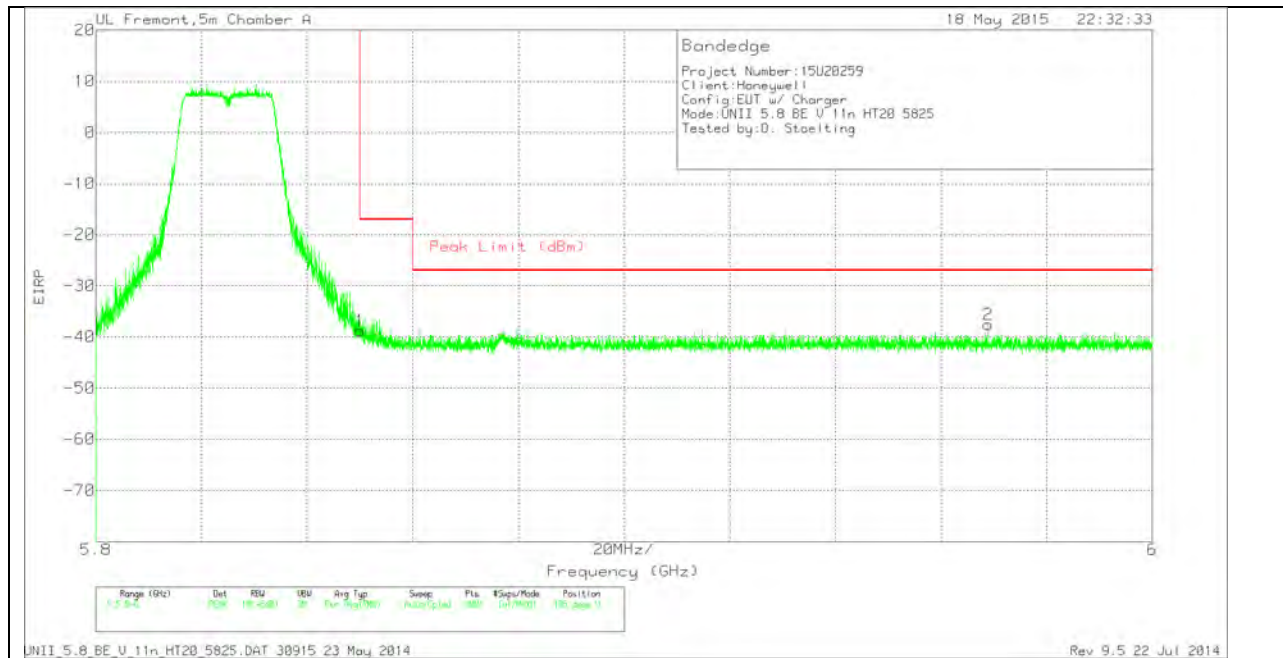
HORIZONTAL PEAK PLOT



HORIZONTAL DATA

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T136 (dB/m)	Amp/Cbl/ Ftr/Pad (dB)	Conversion Factor (dB)	DC Corr (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.85	-61.65	PK	35.1	-20.3	11.8	0	-35.05	-17	-18.05	214	262	H
2	5.877	-63.74	PK	35.1	-20.3	11.8	0	-37.14	-27	-10.14	214	262	H

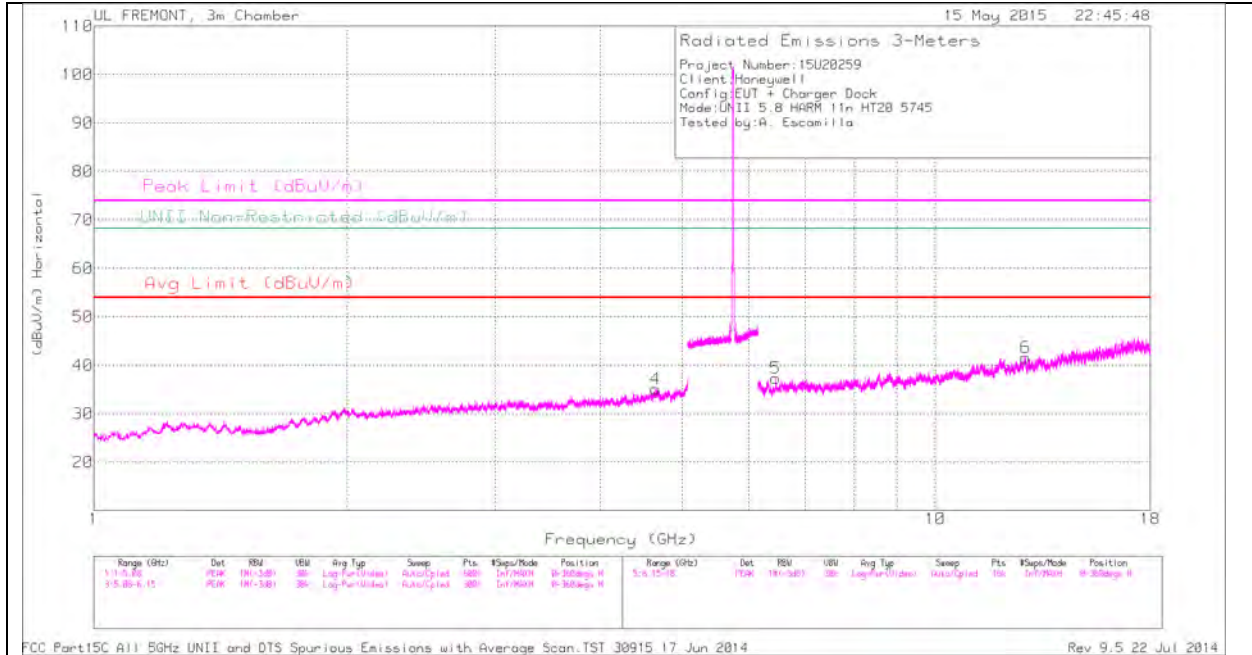
VERTICAL PEAK PLOT



VERTICAL DATA

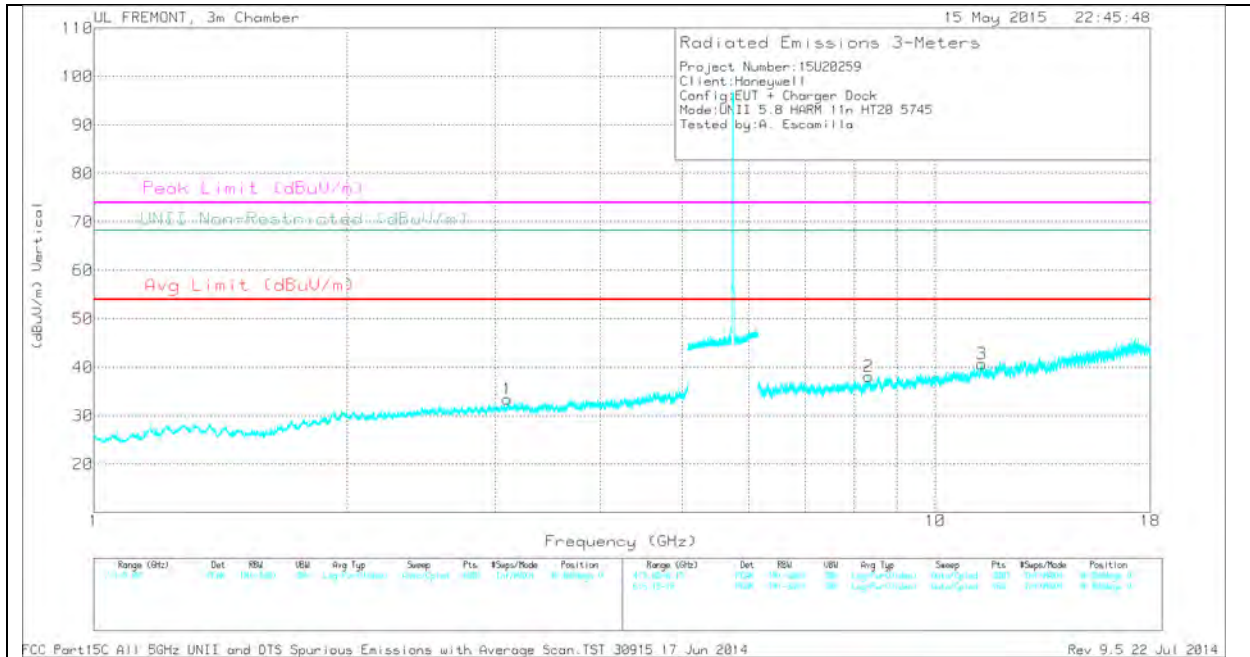
Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AFT136 (dB/m)	Amp/Cbl/ Filtr/Pad (dB)	Conversion Factor (dB)	DC Corr (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.85	-65.36	PK	35.1	-20.3	11.8	0	-38.76	-17	-21.76	106	260	V
2	5.969	-64.67	PK	35.3	-20	11.8	0	-37.57	-27	-10.57	106	260	V

LOW CHANNEL HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

LOW CHANNEL VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

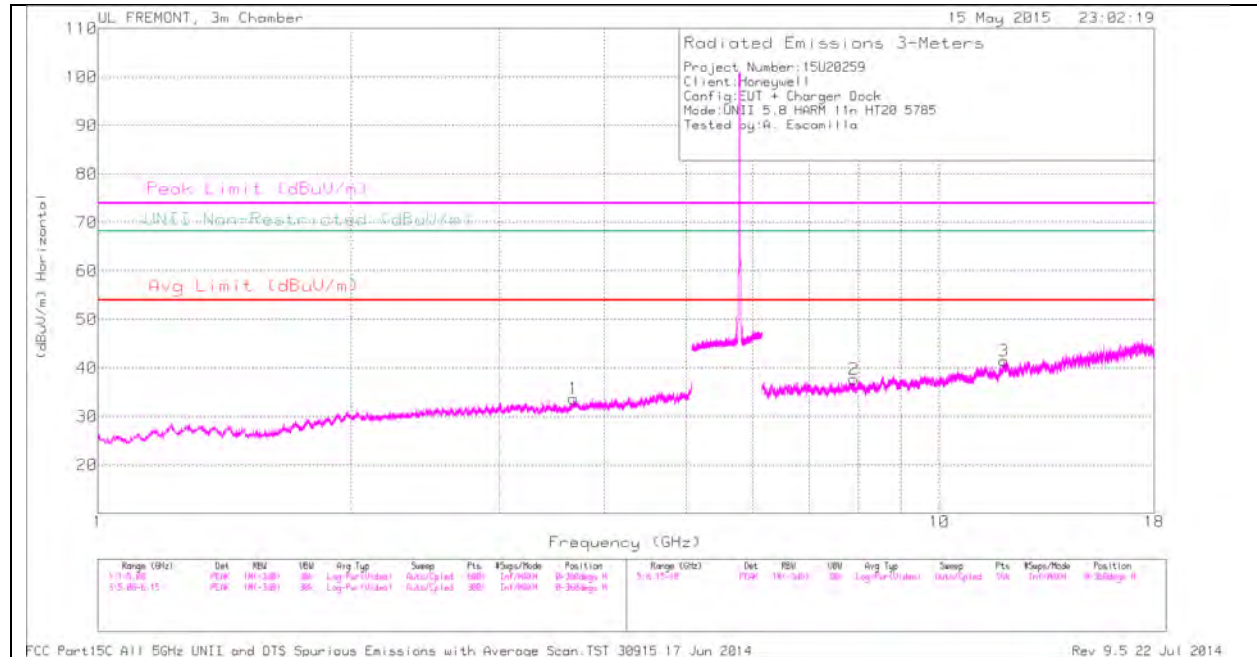
HIGH CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Chl/ Ftr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non- Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	3.099	32.77	PK	32.8	-32.1	0	33.47	-	-	-	-	68.2	-34.73	0-360	100	V
4	4.651	31.67	PK	34	-30.5	0	35.17	-	-	74	-38.83	-	-	0-360	100	H
5	6.46	31.37	PK	35.6	-29.6	0	37.37	-	-	-	-	68.2	-30.83	0-360	200	H
2	8.325	28.85	PK	35.8	-26.5	0	38.15	-	-	74	-35.85	-	-	0-360	100	V
3	11.347	28.22	PK	38.1	-25.6	0	40.72	-	-	74	-33.28	-	-	0-360	200	V
6	12.794	28.53	PK	39.1	-26	0	41.63	-	-	-	-	68.2	-26.57	0-360	200	H

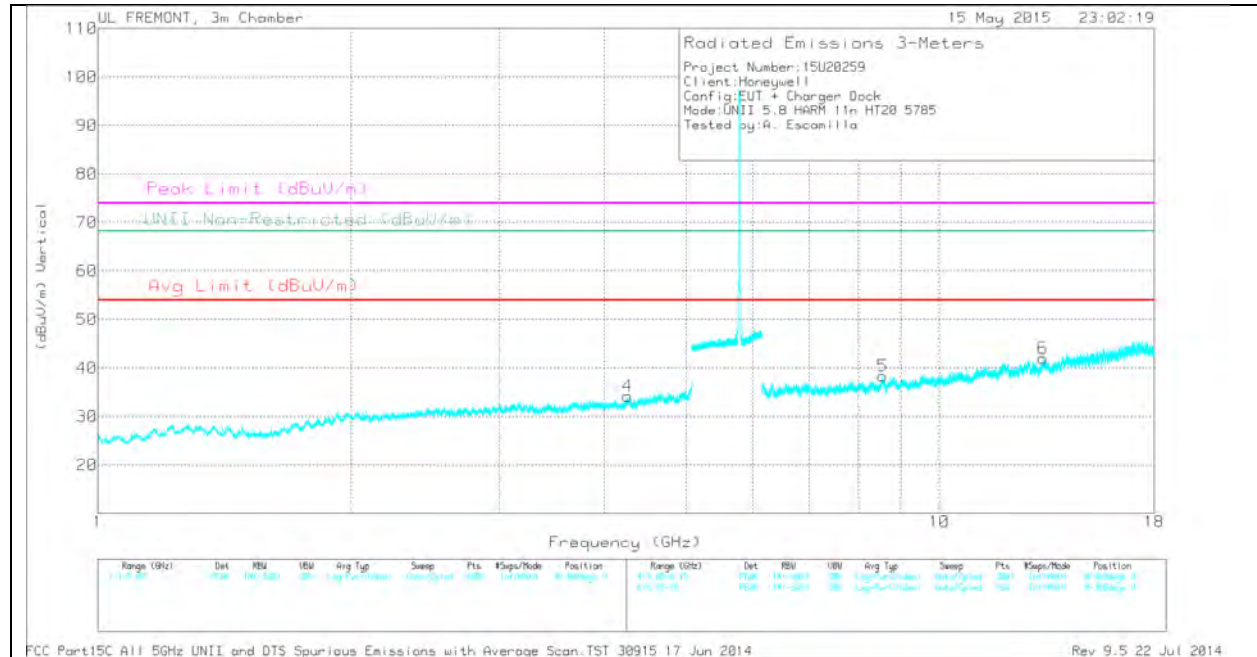
PK - Peak detector

MID CHANNEL HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

MID CHANNEL VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

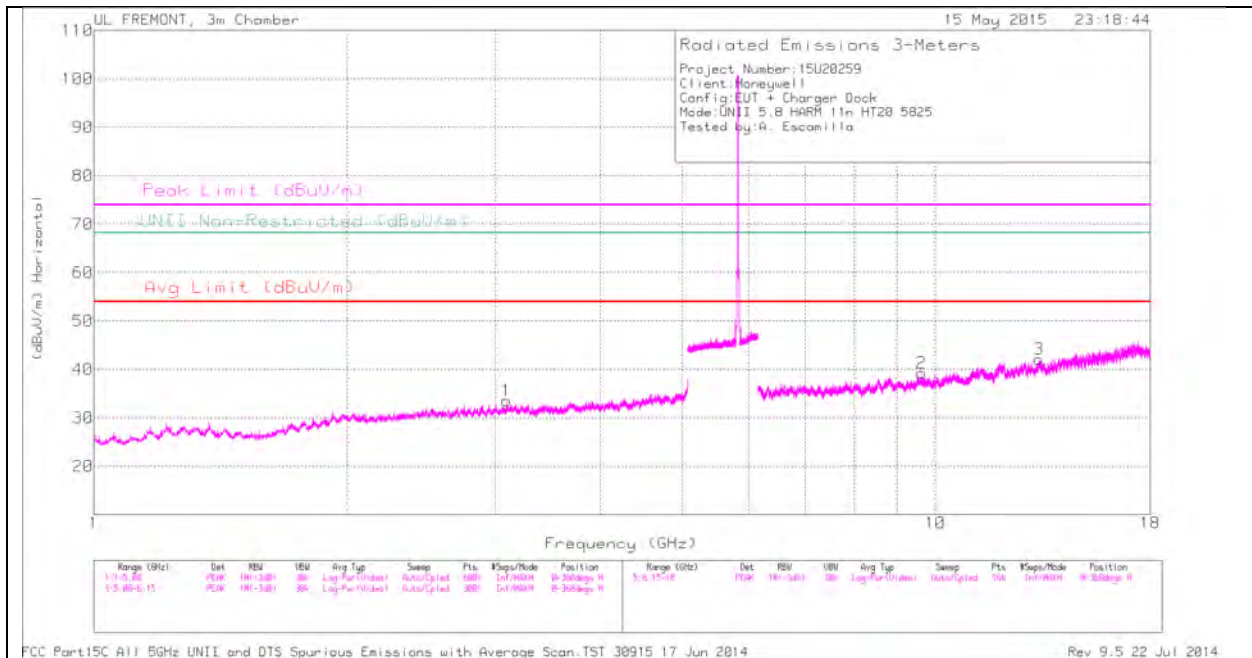
MID CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Chl/ Ftr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	3.677	31.14	PK	33	-30.5	0	33.64	-	-	74	-40.36	-	-	0-360	100	H
4	4.263	31.35	PK	33.4	-30.6	0	34.15	-	-	74	-39.85	-	-	0-360	100	V
2	7.914	30.17	PK	35.8	-28.3	0	37.67	-	-	-	-	68.2	-30.53	0-360	200	H
5	8.565	28.76	PK	35.8	-26.2	0	38.36	-	-	-	-	68.2	-29.84	0-360	100	V
3	11.926	28.61	PK	39.1	-26.2	0	41.51	-	-	74	-32.49	-	-	0-360	100	H
6	13.28	29.11	PK	39	-26.1	0	42.01	-	-	74	-31.99	-	-	0-360	100	V

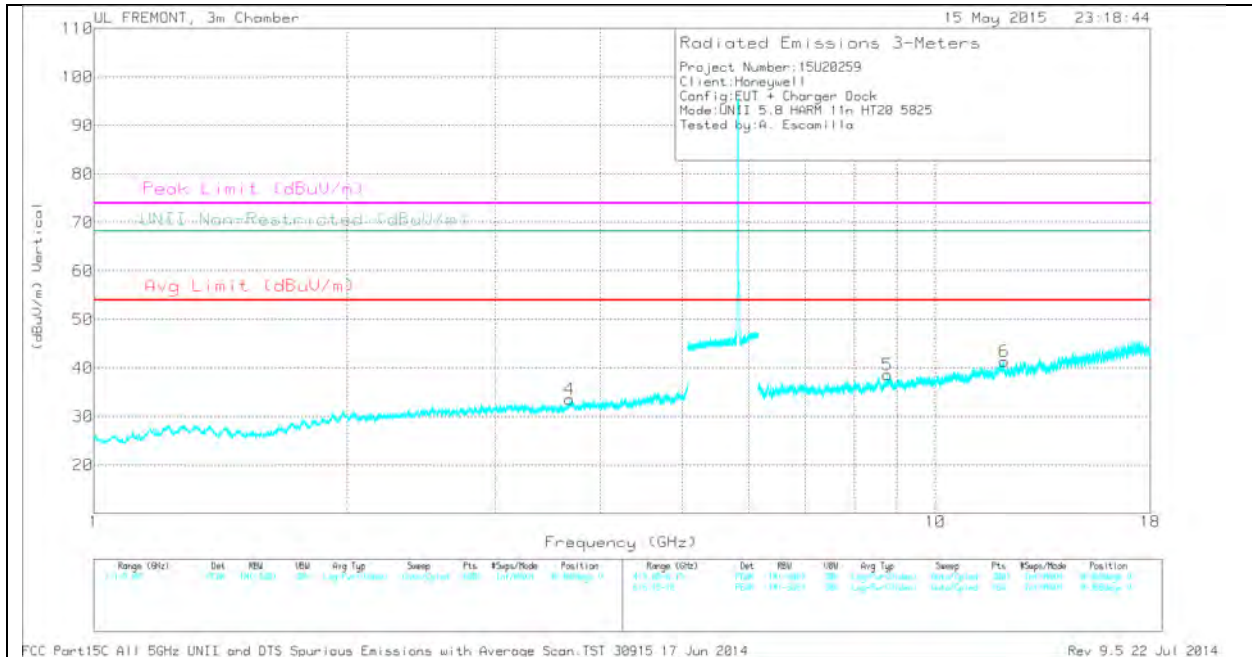
PK - Peak detector

HIGH CHANNEL HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

HIGH CHANNEL VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

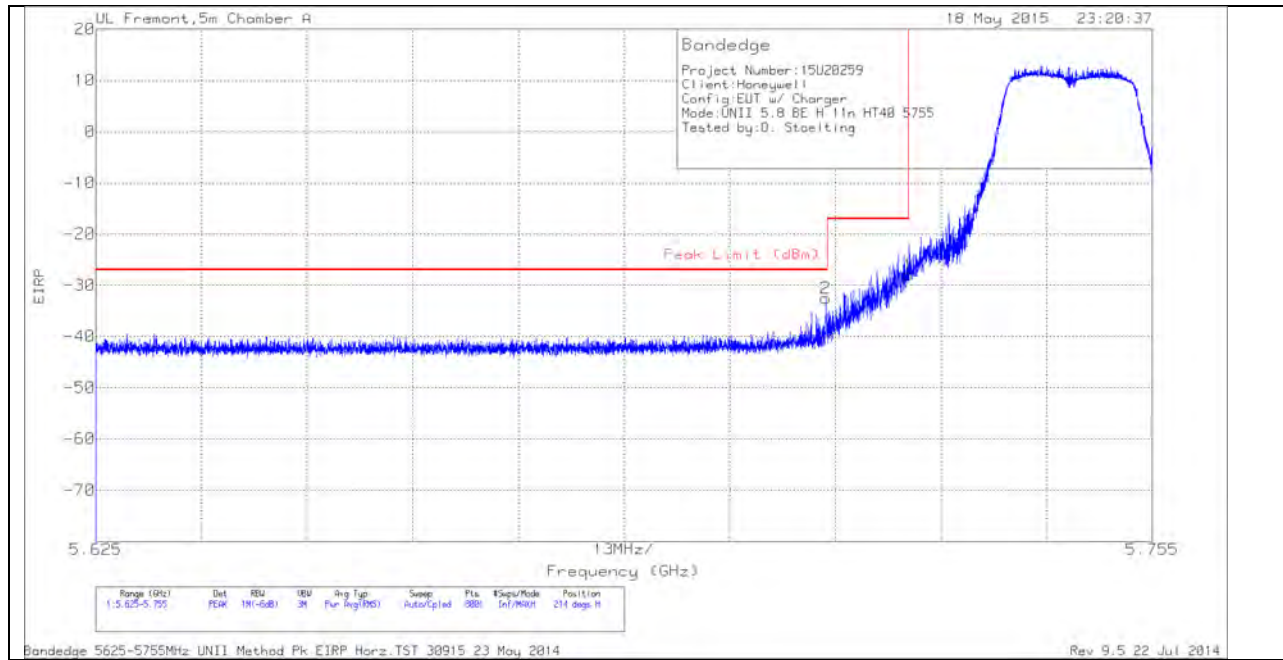
HIGH CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/ Filtr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non- Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	3.093	32.9	PK	32.8	-32.1	0	33.6	-	-	-	-	68.2	-34.6	0-360	100	H
4	3.675	31.07	PK	33	-30.5	0	33.57	-	-	74	-40.43	-	-	0-360	100	V
5	8.767	28.67	PK	35.9	-25.9	0	38.67	-	-	-	-	68.2	-29.53	0-360	100	V
2	9.631	28.32	PK	36.8	-25.8	0	39.32	-	-	-	-	68.2	-28.88	0-360	100	H
6	12.075	28.75	PK	39	-26.4	0	41.35	-	-	74	-32.65	-	-	0-360	200	V
3	13.267	29.33	PK	39	-26.2	0	42.13	-	-	74	-31.87	-	-	0-360	200	H

PK - Peak detector

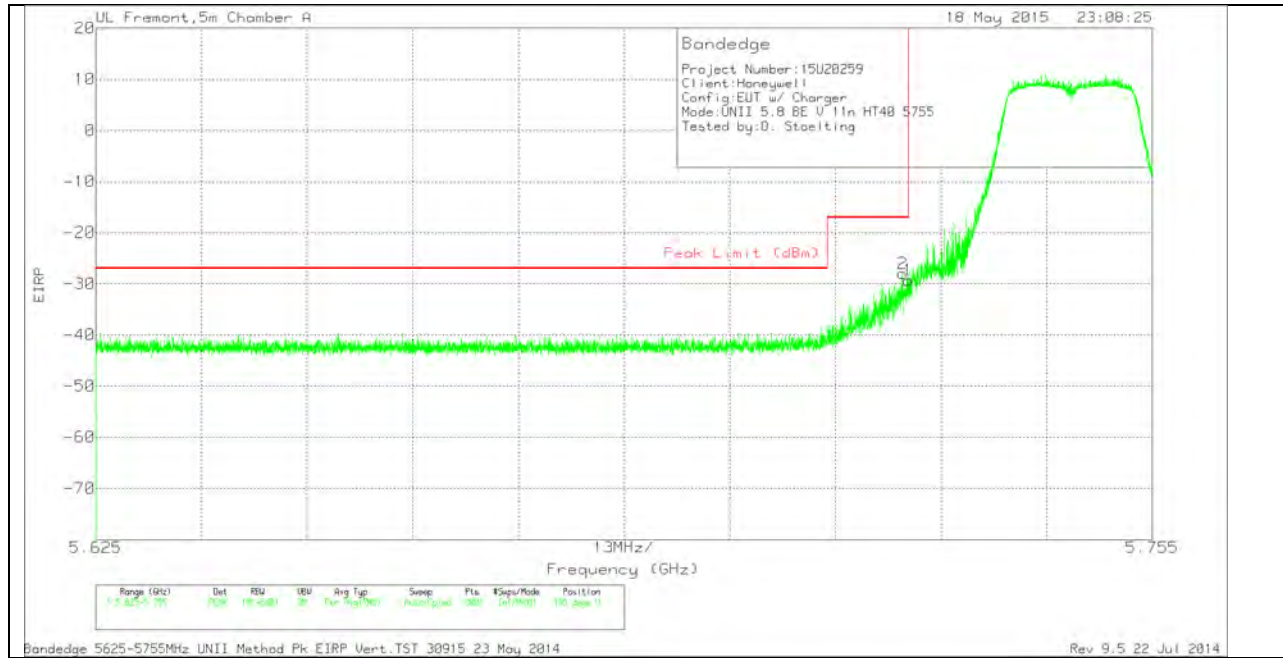
11.4.3. TX ABOVE 1 GHz 802.11n HT40 MODE IN THE 5.8 GHz BAND HARMONICS AND SPURIOUS EMISSIONS HORIZONTAL PEAK PLOT



HORIZONTAL DATA

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AFT136 (dB/m)	Amp/Cbl/ Filt/Pad (dB)	Conversion Factor (dB)	DC Corr (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	5.715	-58.38	PK	34.7	-20.7	11.8	0	-32.58	-27	-5.58	214	244	H
1	5.725	-53.79	PK	34.7	-20.7	11.8	0	-27.99	-17	-10.99	214	244	H

VERTICAL PEAK AND AVERAGE PLOT

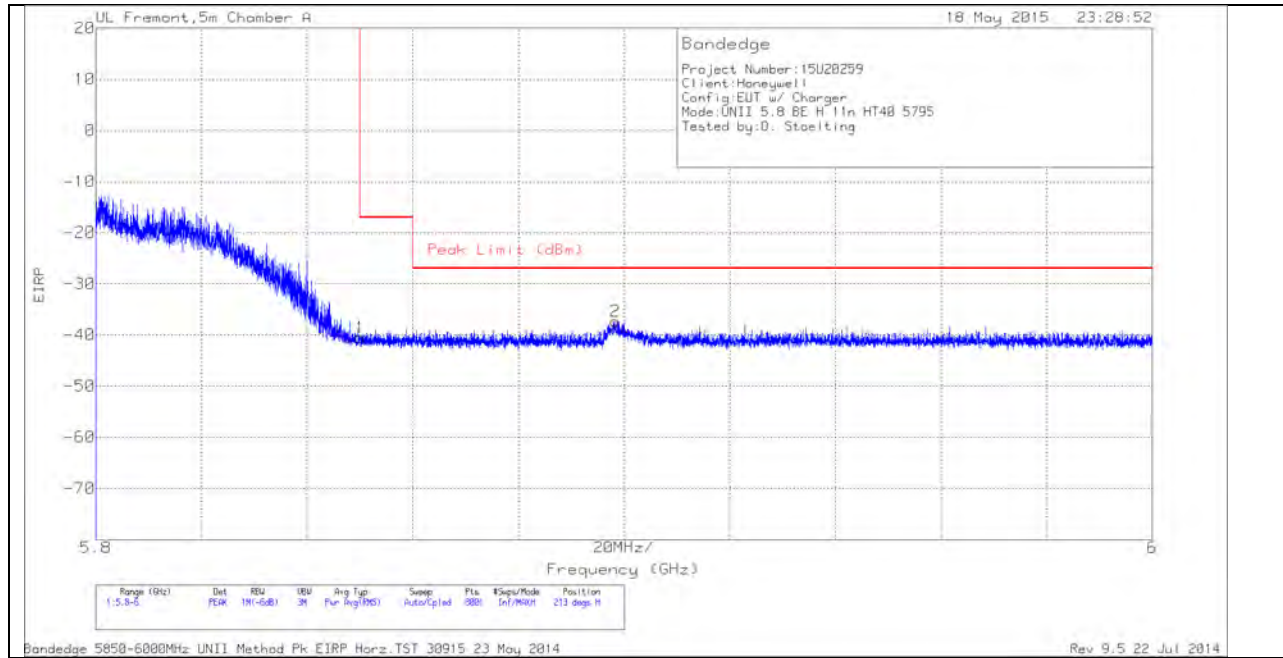


VERTICAL DATA

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AFT136 (dB/m)	Amp/Cbl/ Filt/Pad (dB)	Conversion Factor (dB)	DC Corr (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	5.724	-53.76	PK	34.7	-20.7	11.8	0	-27.96	-17	-10.96	105	242	V
1	5.725	-55.18	PK	34.7	-20.7	11.8	0	-29.38	-17	-12.38	105	242	V

AUTHORIZED BANDEGE (HIGH CHANNEL)

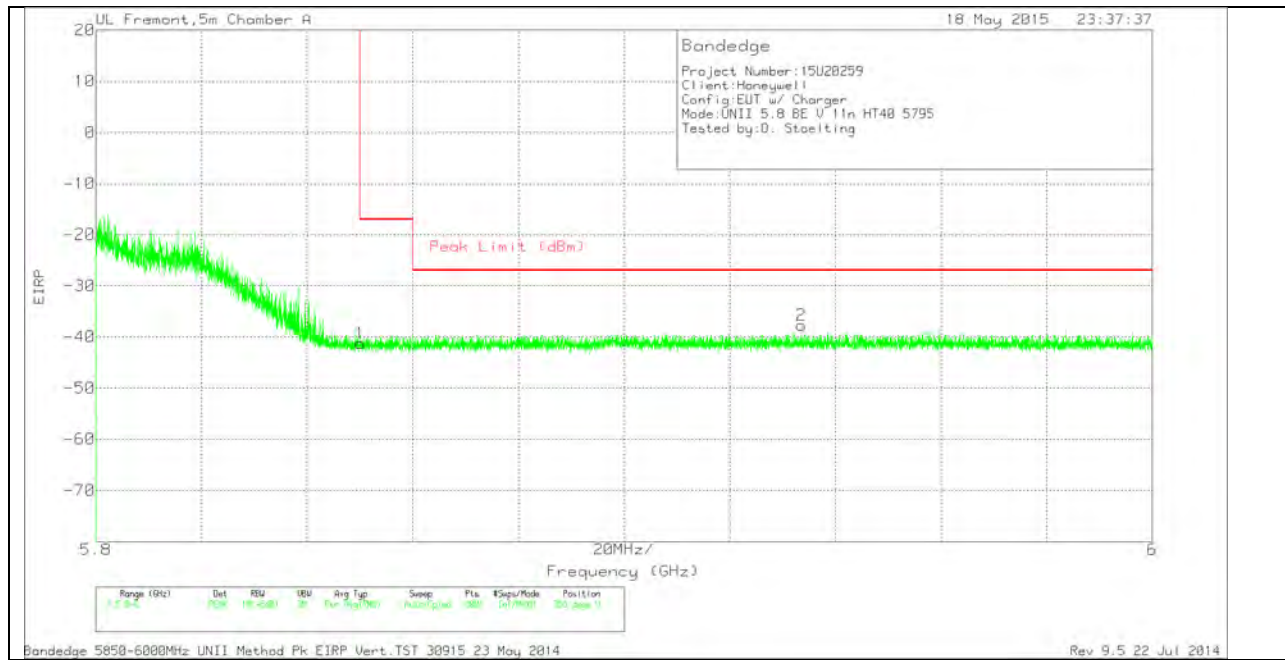
HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T136 (dB/m)	Amp/Cbl/ Ftr/Pad (dB)	Conversion Factor (dB)	DC Corr (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.85	-67.15	PK	35.1	-20.3	11.8	0	-40.55	-17	-23.55	213	214	H
2	5.898	-64.22	PK	35.2	-20.1	11.8	0	-37.32	-27	-10.32	213	214	H

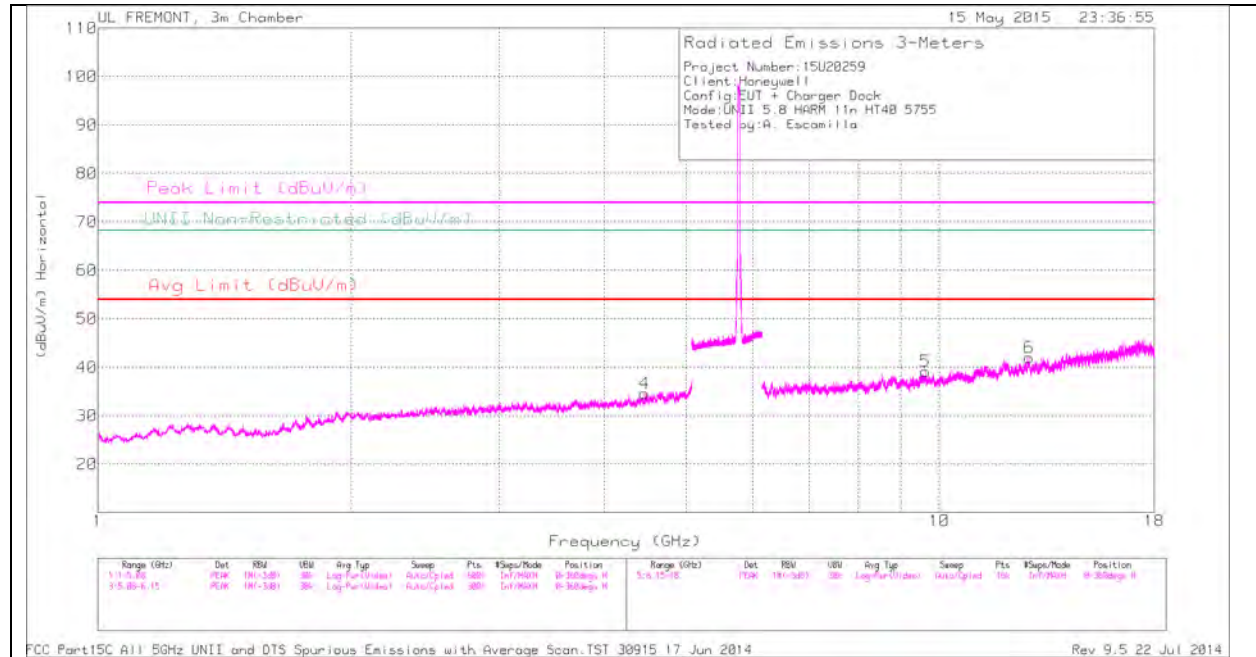
VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

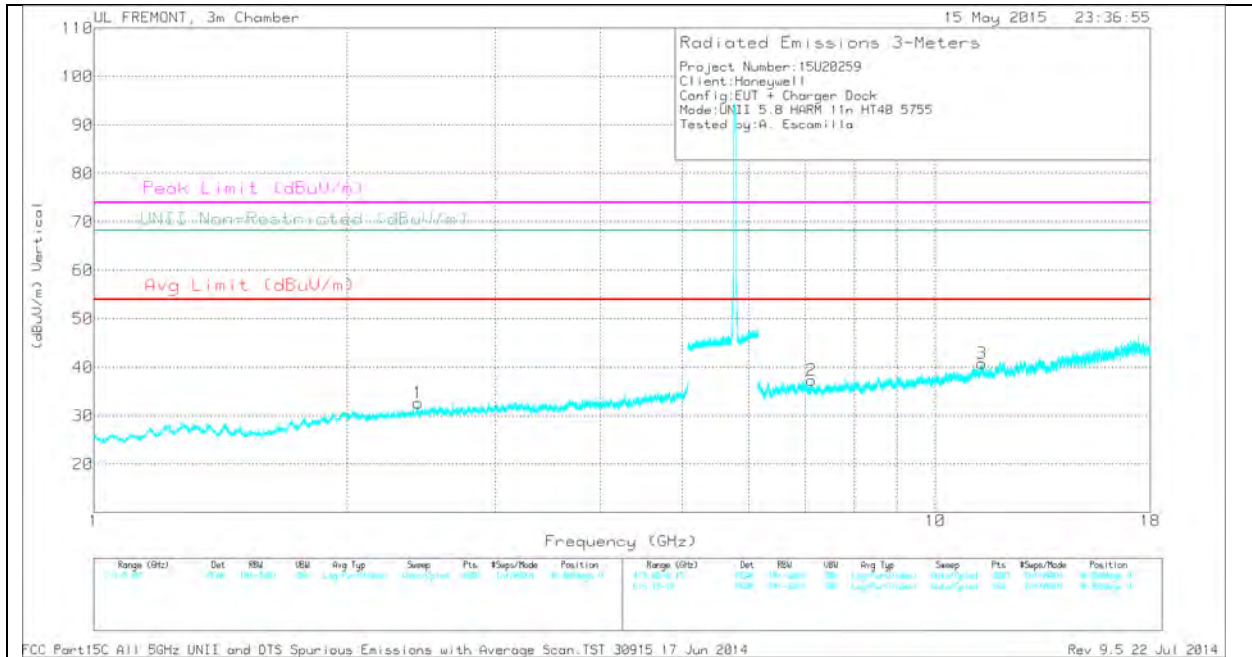
Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T136 (dB/m)	Amp/Cbl/ Fitr/Pad (dB)	Conversion Factor (dB)	DC Corr (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.85	-67.88	PK	35.1	-20.3	11.8	0	-41.28	-17	-24.28	355	191	V
2	5.934	-64.84	PK	35.2	-19.9	11.8	0	-37.74	-27	-10.74	355	191	V

LOW CHANNEL HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

LOW CHANNEL VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

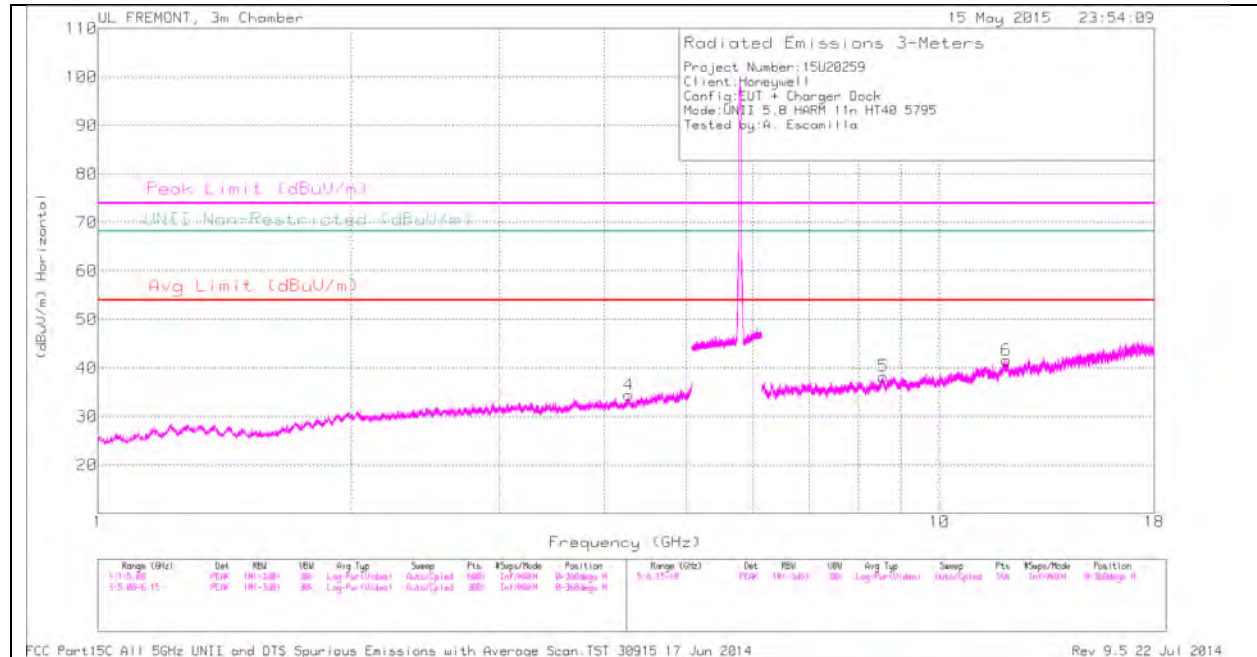
HIGH CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Chl/ Ftr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.427	33.21	PK	32.1	-32.6	0	32.71	-	-	-	-	68.2	-35.49	0-360	100	V
4	4.461	31.83	PK	33.7	-30.9	0	34.63	-	-	-	-	68.2	-33.57	0-360	100	H
2	7.128	30.7	PK	35.6	-29	0	37.3	-	-	-	-	68.2	-30.9	0-360	200	V
5	9.617	27.62	PK	36.7	-25.2	0	39.12	-	-	-	-	68.2	-29.08	0-360	200	H
3	11.356	28.42	PK	38.1	-25.7	0	40.82	-	-	74	-33.18	-	-	0-360	200	V
6	12.778	28.77	PK	39.1	-25.9	0	41.97	-	-	-	-	68.2	-26.23	0-360	100	H

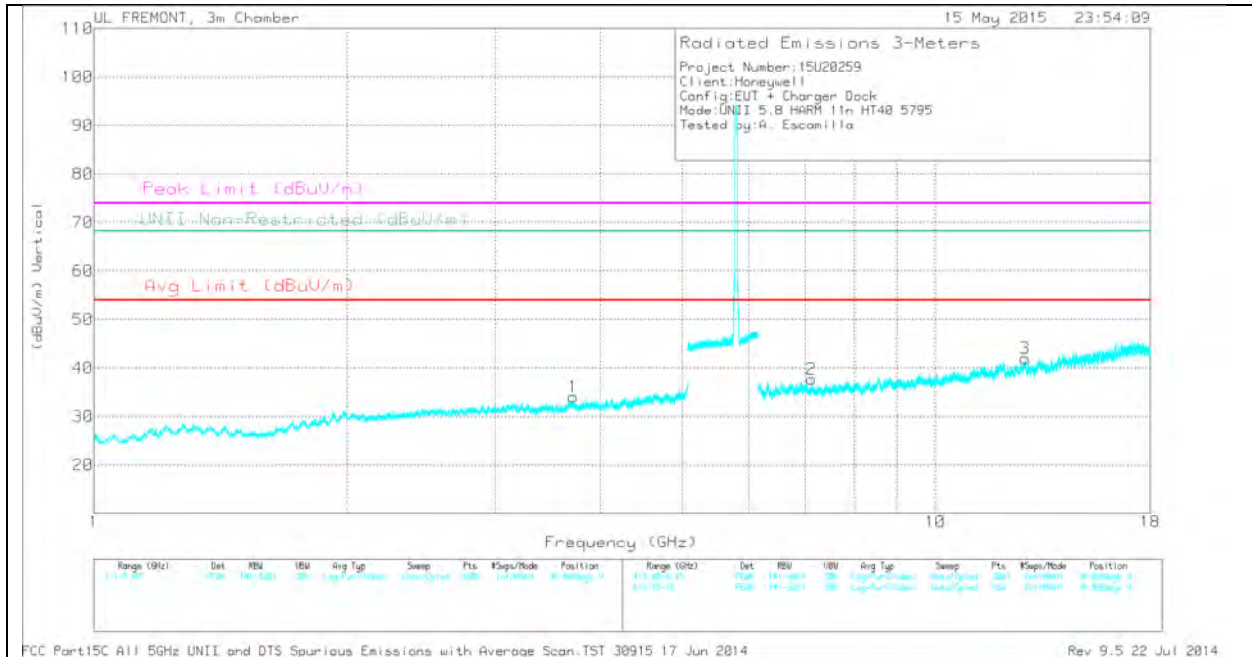
PK - Peak detector

HIGH CHANNEL HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

HIGH CHANNEL VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

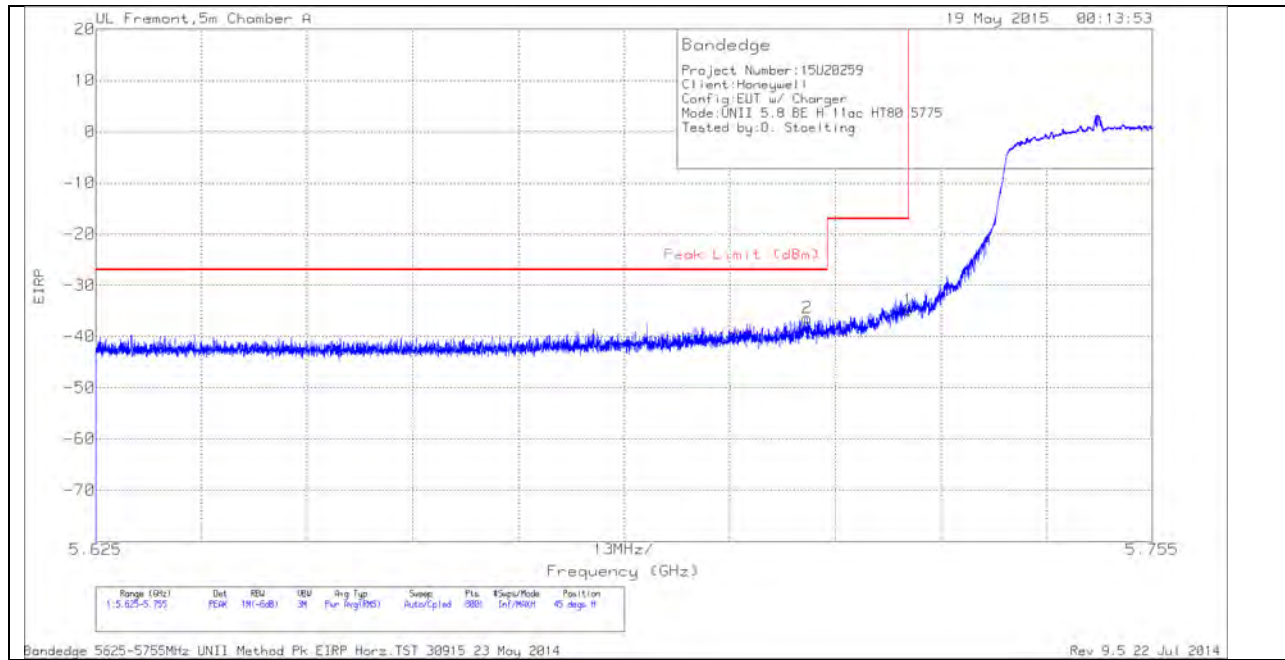
HIGH CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Chl/ Ftr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	3.71	31.87	PK	33	-30.8	0	34.07	-	-	74	-39.93	-	-	0-360	100	V
4	4.274	31.21	PK	33.5	-30.3	0	34.41	-	-	74	-39.59	-	-	0-360	100	H
2	7.127	31.12	PK	35.6	-29	0	37.72	-	-	-	-	68.2	-30.48	0-360	200	V
5	8.572	28.7	PK	35.8	-26.2	0	38.3	-	-	-	-	68.2	-29.9	0-360	200	H
6	12.018	28.59	PK	39.1	-26.1	0	41.59	-	-	74	-32.41	-	-	0-360	100	H
3	12.771	28.84	PK	39.1	-26	0	41.94	-	-	-	-	68.2	-26.26	0-360	200	V

PK - Peak detector

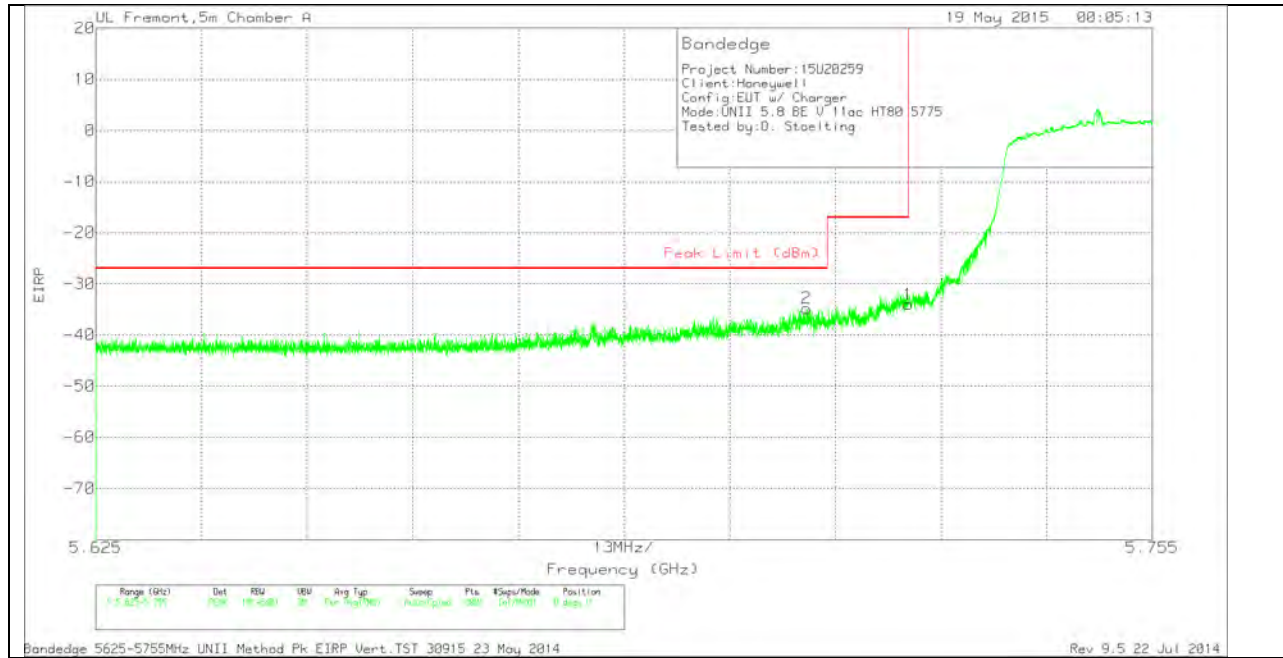
11.4.4. TX ABOVE 1 GHz 802.11ac HT80 MODE IN THE 5.8 GHz BAND HARMONICS AND SPURIOUS EMISSIONS HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AFT136 (dB/m)	Amp/Cbl/ Filt/Pad (dB)	Conversion Factor (dB)	DC Corr (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	5.713	-62.11	PK	34.7	-20.7	11.8	0	-36.31	-27	-9.31	45	277	H
1	5.725	-60.7	PK	34.7	-20.7	11.8	0	-34.9	-17	-17.9	45	277	H

VERTICAL PEAK AND AVERAGE PLOT

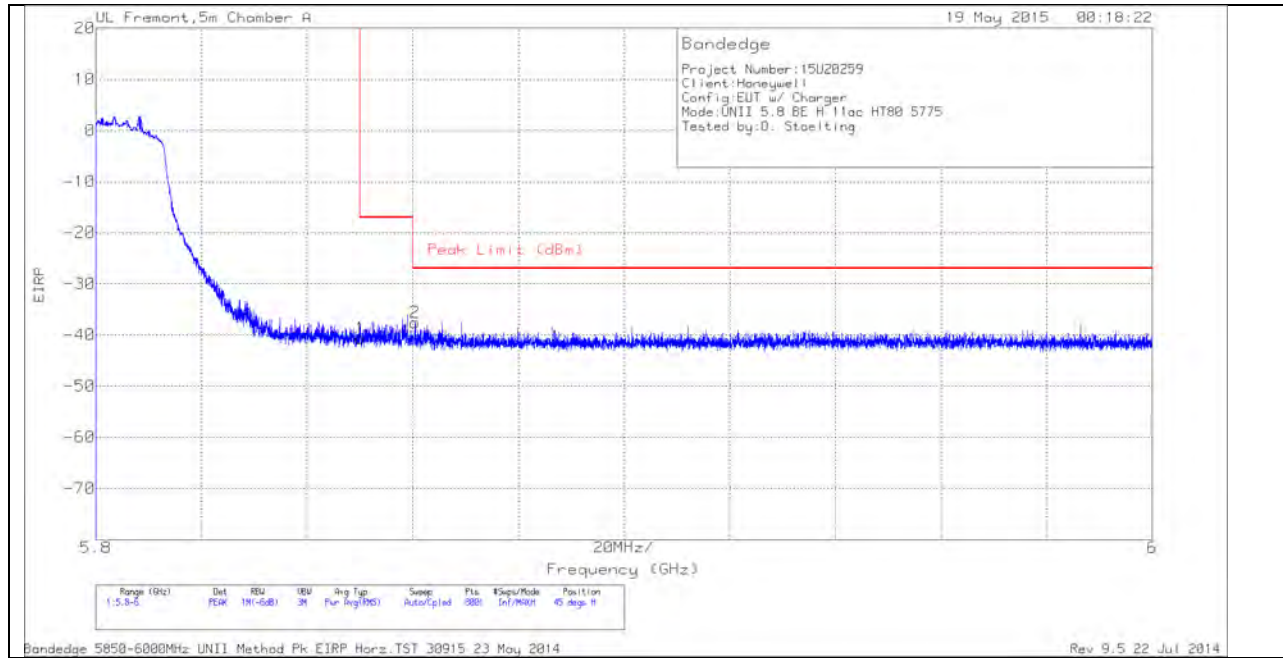


VERTICAL DATA

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AFT136 (dB/m)	Amp/Cbl/ Filt/Pad (dB)	Conversion Factor (dB)	DC Corr (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	5.712	-60.6	PK	34.7	-20.7	11.8	0	-34.8	-27	-7.8	0	277	V
1	5.725	-59.76	PK	34.7	-20.7	11.8	0	-33.96	-17	-16.96	0	277	V

AUTHORIZED BANDEGE (HIGH CHANNEL)

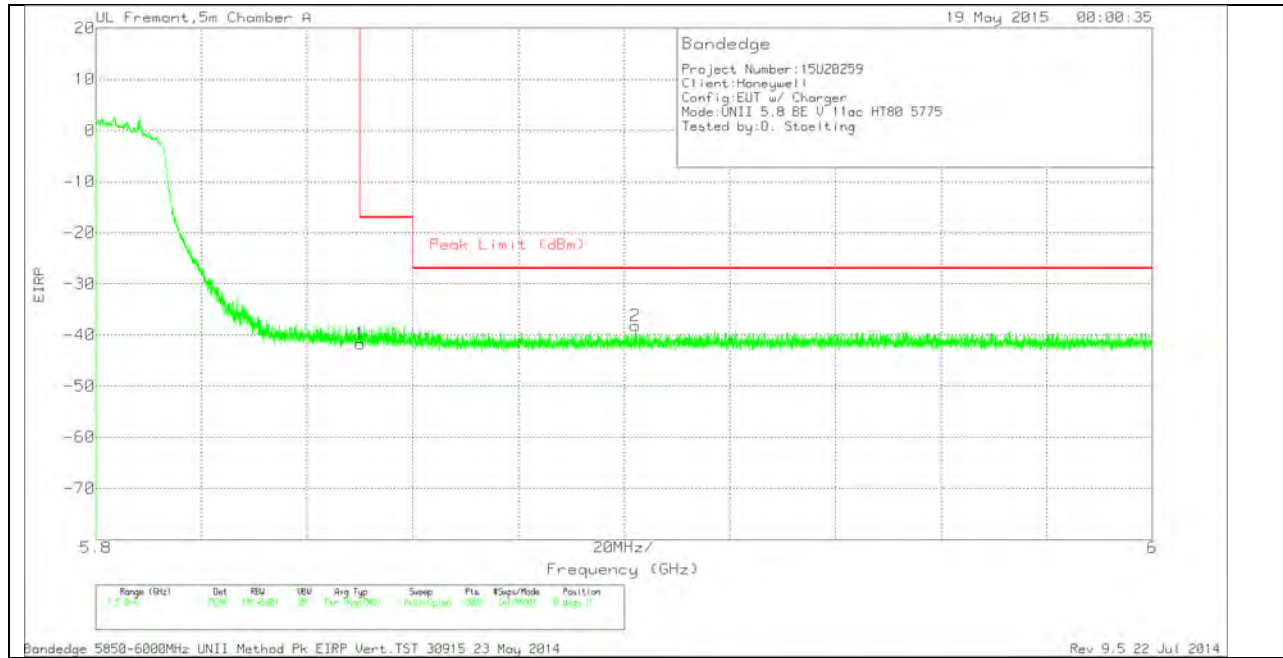
HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T136 (dB/m)	Amp/Cb/ Ftr/Pad (dB)	Conversion Factor (dB)	DC Corr (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.85	-67.29	PK	35.1	-20.3	11.8	0	-40.69	-17	-23.69	45	277	H
2	5.86	-64.22	PK	35.1	-20.3	11.8	0	-37.62	-27	-10.62	45	277	H

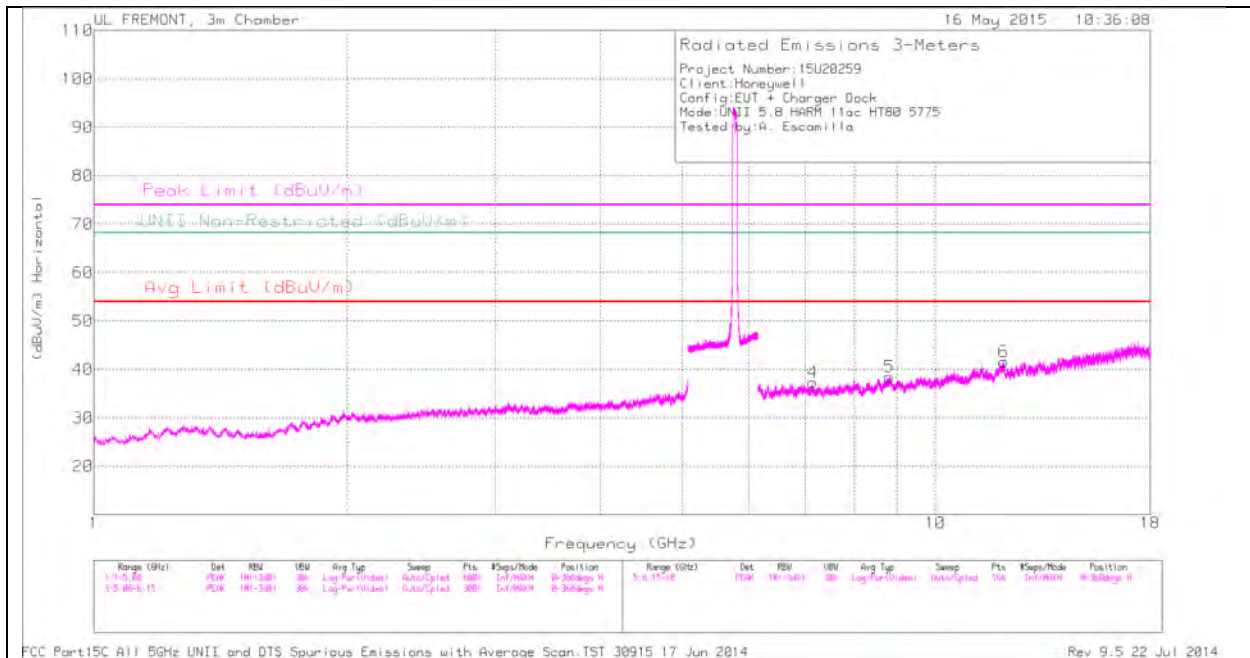
VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T136 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Conversion Factor (dB)	DC Corr (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.85	-68.33	PK	35.1	-20.3	11.8	0	-41.73	-17	-24.73	0	277	V
2	5.902	-65.1	PK	35.2	-20.1	11.8	0	-38.2	-27	-11.2	0	277	V

LOW CHANNEL HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

UL FREMONT, 3m Chamber

16 May 2015 10:36:08

Radiated Emissions 3-Meters

Project Number: 15U20259
 Client: Honeywell
 Config: EUT + Charger Dock
 Made: UNII 5.8 HARM 11ac HT80 5775
 Tested by: A. Escanilla

Peak Limit (dBuV/m)
 UNII Non-Restricted (dBuV/m)
 Avg Limit (dBuV/m)

(dBuV/m) Vertical

Frequency (GHz)

Range (GHz)	Det	RBW	VBW	Avg Type	Sweep	Pts	Expos/Mode	Position	Range (GHz)	Det	RBW	VBW	Avg Type	Sweep	Pts	Expos/Mode	Position
1.1-6.0	Peak	100 Hz	200 Hz	Log Per Channel	Auto/Normal	1000	1000/Normal	0	6.1-18.0	Peak	100 Hz	200 Hz	Log Per Channel	Auto/Normal	1000	1000/Normal	0

FCC Part 15C All 5GHz UNII and DTS Spurious Emissions with Average Scan.TST 30915 17 Jun 2014

Rev 9.5 22 Jul 2014

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LOW CHANNEL DATA

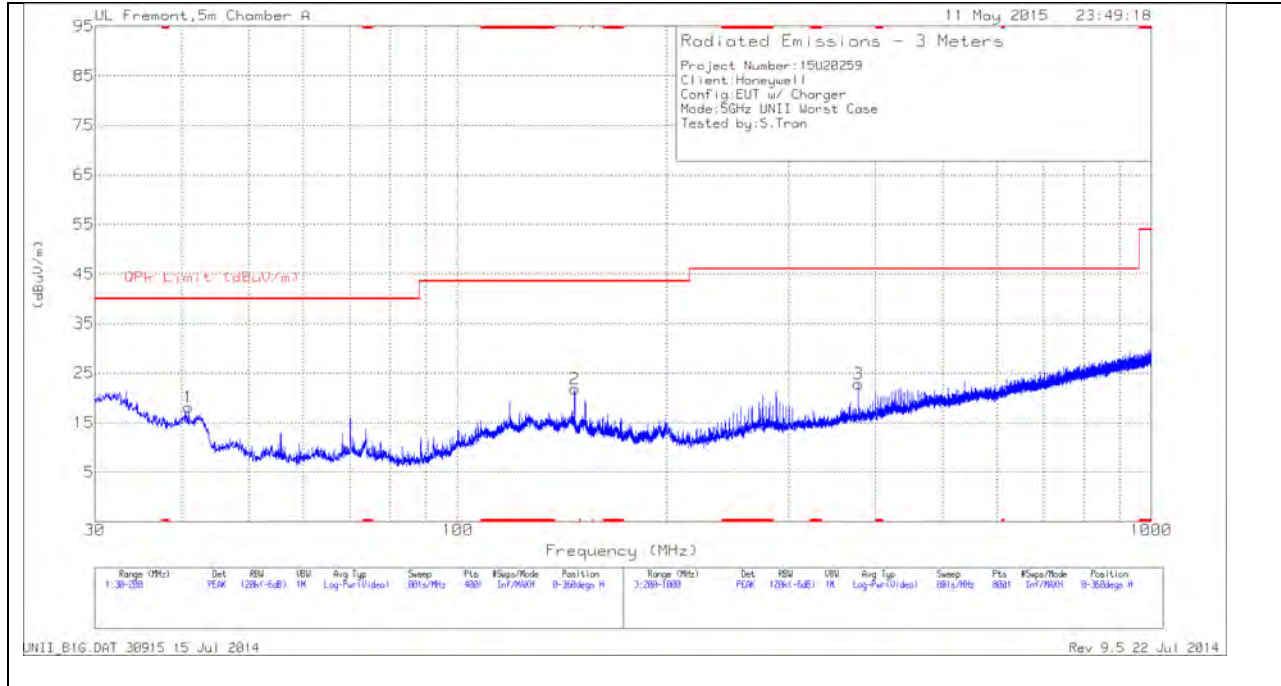
TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Chl/Fitr /Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	4.269	31.28	PK	33.4	-30.3	34.38	-	-	74	-39.62	-	-	0-360	100	V
4	7.149	30.53	PK	35.6	-28.8	37.33	-	-	-	-	68.2	-30.87	0-360	200	H
2	8.532	29.15	PK	35.8	-26.7	38.25	-	-	-	-	68.2	-29.95	0-360	200	V
5	8.816	28.11	PK	35.9	-25.5	38.51	-	-	-	-	68.2	-29.69	0-360	200	H
3	11.903	28.49	PK	39.1	-26.3	41.29	-	-	74	-32.71	-	-	0-360	100	V
6	12.049	28.67	PK	39.1	-26.2	41.57	-	-	74	-32.43	-	-	0-360	200	H

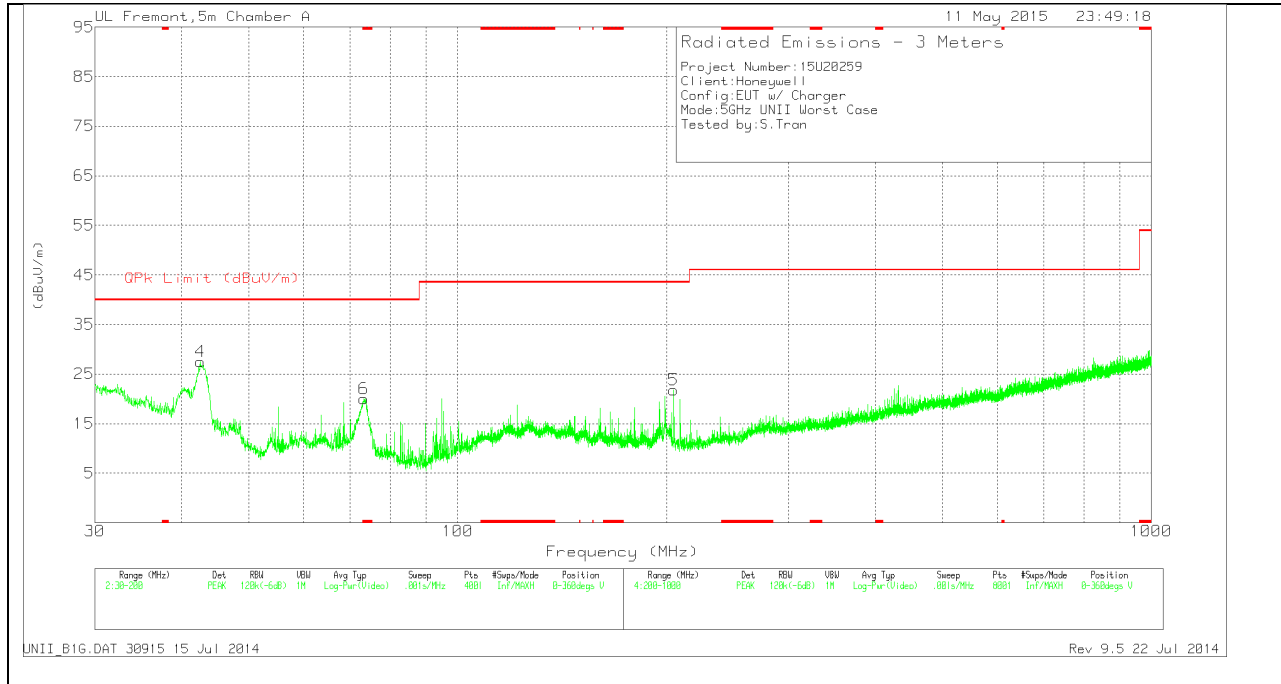
PK - Peak detector

12. WORST-CASE BELOW 1 GHz (in the 5.3 GHz Band)

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



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



Below 1G Data

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T243 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
6	* 73.2225	40.44	PK	8	-28.4	20.04	40	-19.96	0-360	101	V
1	40.9225	33.56	PK	13.4	-28.8	18.16	40	-21.84	0-360	400	H
4	42.58	44.06	PK	12.2	-28.7	27.56	40	-12.44	0-360	101	V
2	147.47	36.66	PK	12.6	-27.5	21.76	43.52	-21.76	0-360	200	H
5	205	37.76	PK	10.9	-26.9	21.76	43.52	-21.76	0-360	200	V
3	378.1	33.51	PK	15.2	-25.9	22.81	46.02	-23.21	0-360	101	H

13. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 8.8

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

^{*} Decreases with the logarithm of the frequency.

TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.4.

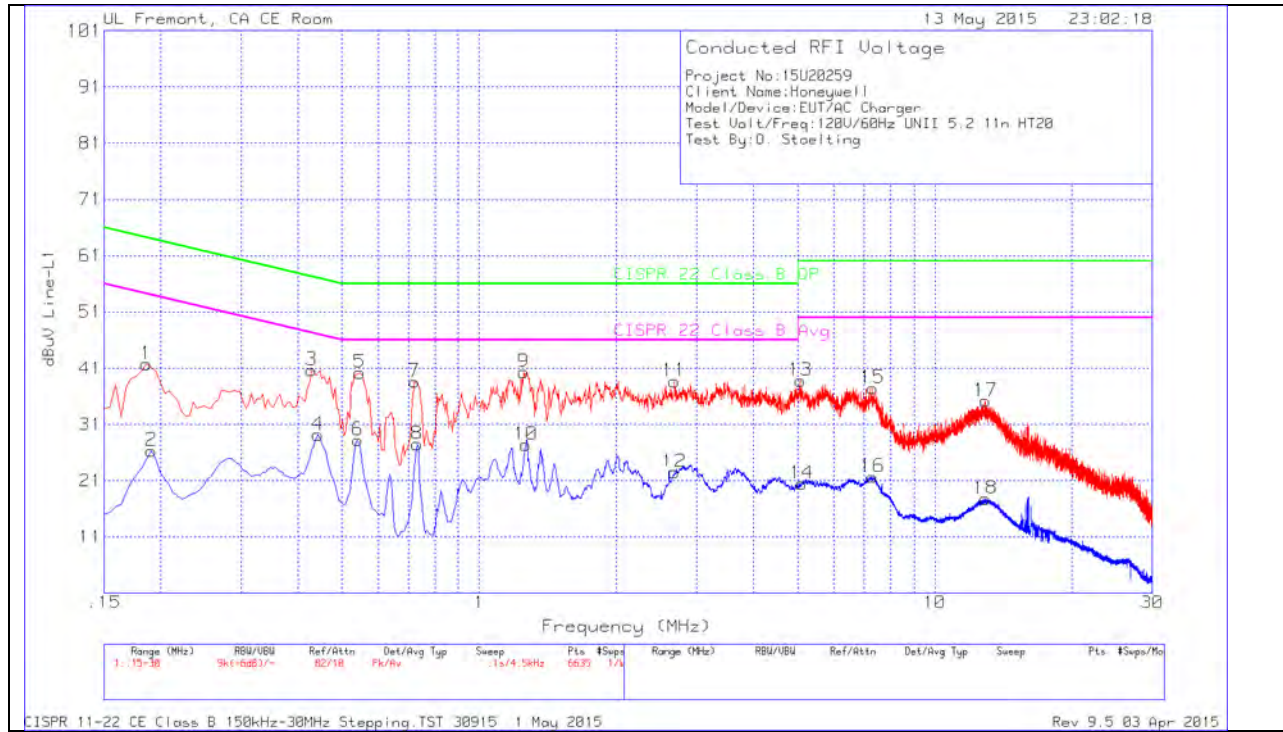
The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

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

RESULTS

6 WORST EMISSIONS

LINE 1 PLOT

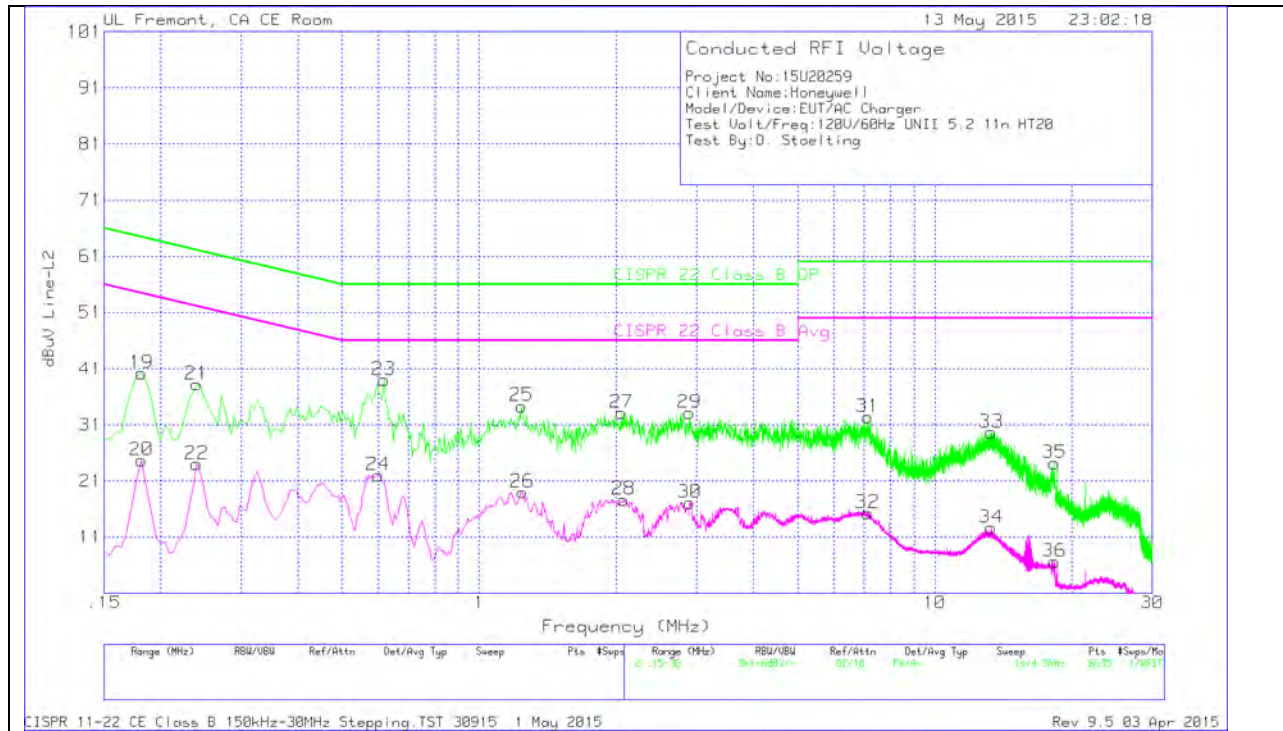


LINE 1 RESULTS

Range 1: Line-L1 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L1	LC Cables 1&3	Corrected Reading dBuV	CISPR 22 Class B QP	Margin (dB)	CISPR 22 Class B Avg	Margin (dB)
1	.186	40.69	Pk	1	0	41.69	64.21	-22.52	54.21	-12.52
2	.1905	25.29	Av	1	0	26.29	-	-	54.01	-27.72
3	.429	40.25	Pk	.4	0	40.65	57.27	-16.62	47.27	-6.62
4	.4425	28.75	Av	.4	0	29.15	-	-	47.01	-17.86
5	.546	39.92	Pk	.3	0	40.22	56	-15.78	46	-5.78
6	.5415	27.92	Av	.3	0	28.22	-	-	46	-17.78
7	.7215	38.29	Pk	.3	0	38.59	56	-17.41	46	-7.41
8	.7305	27.19	Av	.3	0	27.49	-	-	46	-18.51
9	1.2525	40.12	Pk	.2	0	40.32	56	-15.68	46	-5.68
10	1.266	27.09	Av	.2	.1	27.39	-	-	46	-18.61
11	2.6835	38.4	Pk	.2	.1	38.7	56	-17.3	46	-7.3
12	2.6835	22.2	Av	.2	.1	22.5	-	-	46	-23.5
13	5.0685	38.51	Pk	.2	.1	38.81	60	-21.19	50	-11.19
14	5.1045	20.2	Av	.2	.1	20.5	-	-	50	-29.5
15	7.3005	37.13	Pk	.2	.1	37.43	60	-22.57	50	-12.57
16	7.305	21.38	Av	.2	.1	21.68	-	-	50	-28.32
17	12.93	34.77	Pk	.2	.2	35.17	60	-24.83	50	-14.83
18	12.9255	17.41	Av	.2	.2	17.81	-	-	50	-32.19

LINE 2 PLOT



LINE 2 RESULTS

Range 2: Line-L2 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L2	LC Cables 2&3	Corrected Reading dBuV	CISPR 22 Class B QP	Margin (dB)	CISPR 22 Class B Avg	Margin (dB)
19	.1815	38.99	Pk	1.2	0	40.19	64.42	-24.23	54.42	-14.23
20	.1815	23.48	Av	1.2	0	24.68	-	-	54.42	-29.74
21	.24	37.41	Pk	.8	0	38.21	62.1	-23.89	52.1	-13.89
22	.24	23.23	Av	.8	0	24.03	-	-	52.1	-28.07
23	.618	38.7	Pk	.3	0	39	56	-17	46	-7
24	.6	21.74	Av	.3	0	22.04	-	-	46	-23.96
25	1.239	34.04	Pk	.2	.1	34.34	56	-21.66	46	-11.66
26	1.2435	18.69	Av	.2	.1	18.99	-	-	46	-27.01
27	2.0535	32.85	Pk	.2	.1	33.15	56	-22.85	46	-12.85
28	2.076	17.4	Av	.2	.1	17.7	-	-	46	-28.3
29	2.895	32.86	Pk	.2	.1	33.16	56	-22.84	46	-12.84
30	2.8995	16.85	Av	.2	.1	17.15	-	-	46	-28.85
31	7.134	32.09	Pk	.2	.1	32.39	60	-27.61	50	-17.61
32	7.1205	15	Av	.2	.1	15.3	-	-	50	-34.7
33	13.308	29.25	Pk	.2	.2	29.65	60	-30.35	50	-20.35
34	13.308	12.26	Av	.2	.2	12.66	-	-	50	-37.34
35	18.321	23.7	Pk	.3	.2	24.2	60	-35.8	50	-25.8
36	18.321	6.13	Av	.3	.2	6.63	-	-	50	-43.37

14. DYNAMIC FREQUENCY SELECTION- Android Based

14.1. OVERVIEW

14.1.1. LIMITS

INDUSTRY CANADA

IC RSS-210 is closely harmonized with FCC Part 15 DFS rules. The deviations are as follows:

RSS-210 Issue 8 A9.3

Note: For the band 5600–5650 MHz, no operation is permitted.

Until further notice, devices subject to this annex shall not be capable of transmitting in the band 5600–5650 MHz. This restriction is for the protection of Environment Canada weather radars operating in this band.

FCC

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

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

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

Table 2: Applicability of DFS requirements during normal operation

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

Additional requirements for devices with multiple bandwidth modes	Master Device or Client with Radar DFS	Client (without DFS)
<i>U-NII Detection Bandwidth and Statistical Performance Check</i>	All BW modes must be tested	Not required
<i>Channel Move Time and Channel Closing Transmission Time</i>	Test using widest BW mode available	Test using the widest BW mode available for the link
<i>All other tests</i>	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 all 20 MHz channel blocks and a null frequency between the bonded 20 MHz channel blocks.		

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

Maximum Transmit Power	Value (see notes)
E.I.R.P. $\geq$ 200 mill watt	-64 dBm
E.I.R.P. < 200 mill watt and power spectral density < 10 dBm/MHz	-62 dBm
E.I.R.P. < 200 mill watt that do not meet power spectral density requirement	-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. Note 3: E.I.R.P. is based on the highest antenna gain. For MIMO devices refer to KDB publication 662911 D01.	

Table 4: DFS Response requirement values

Parameter	Value
<i>Non-occupancy period</i>	30 minutes
<i>Channel Availability Check Time</i>	60 seconds
<i>Channel Move Time</i>	10 seconds (See Note 1)
<i>Channel Closing Transmission Time</i>	200 milliseconds + approx. 60 milliseconds over remaining 10 second period. (See Notes 1 and 2)
<i>U-NII Detection Bandwidth</i>	Minimum 100% of the U- NII 99% transmission power bandwidth. (See Note 3)
Note 1: <i>Channel Move Time</i> and the <i>Channel Closing Transmission Time</i> should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst. Note 2: The <i>Channel Closing Transmission Time</i> is comprised of 200 milliseconds starting at the beginning of the <i>Channel Move Time</i> plus any additional intermittent control signals required to facilitate a <i>Channel</i> move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions. Note 3: During the <i>U-NII Detection Bandwidth</i> detection test, radar type 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.	

Table 5 – Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (usec)	PRI (usec)	Pulses	Minimum Percentage of Successful Detection	Minimum Trials
0	1	1428	18	See Note 1	See Note 1
1	1	Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in table 5a	Roundup: $\{(1/360) \times (19 \times 10^6 \text{ PRI}_{\text{usec}})\}$	60%	30
		Test B: 15 unique PRI values randomly selected within the range of 518-3066 usec. With a minimum increment of 1 usec, excluding PRI values selected in Test A			
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 <i>Detection Bandwidth</i> test, <i>Channel Move Time</i> , and <i>Channel Closing Time</i> tests.					

Table 6 – Long Pulse Radar Test Signal

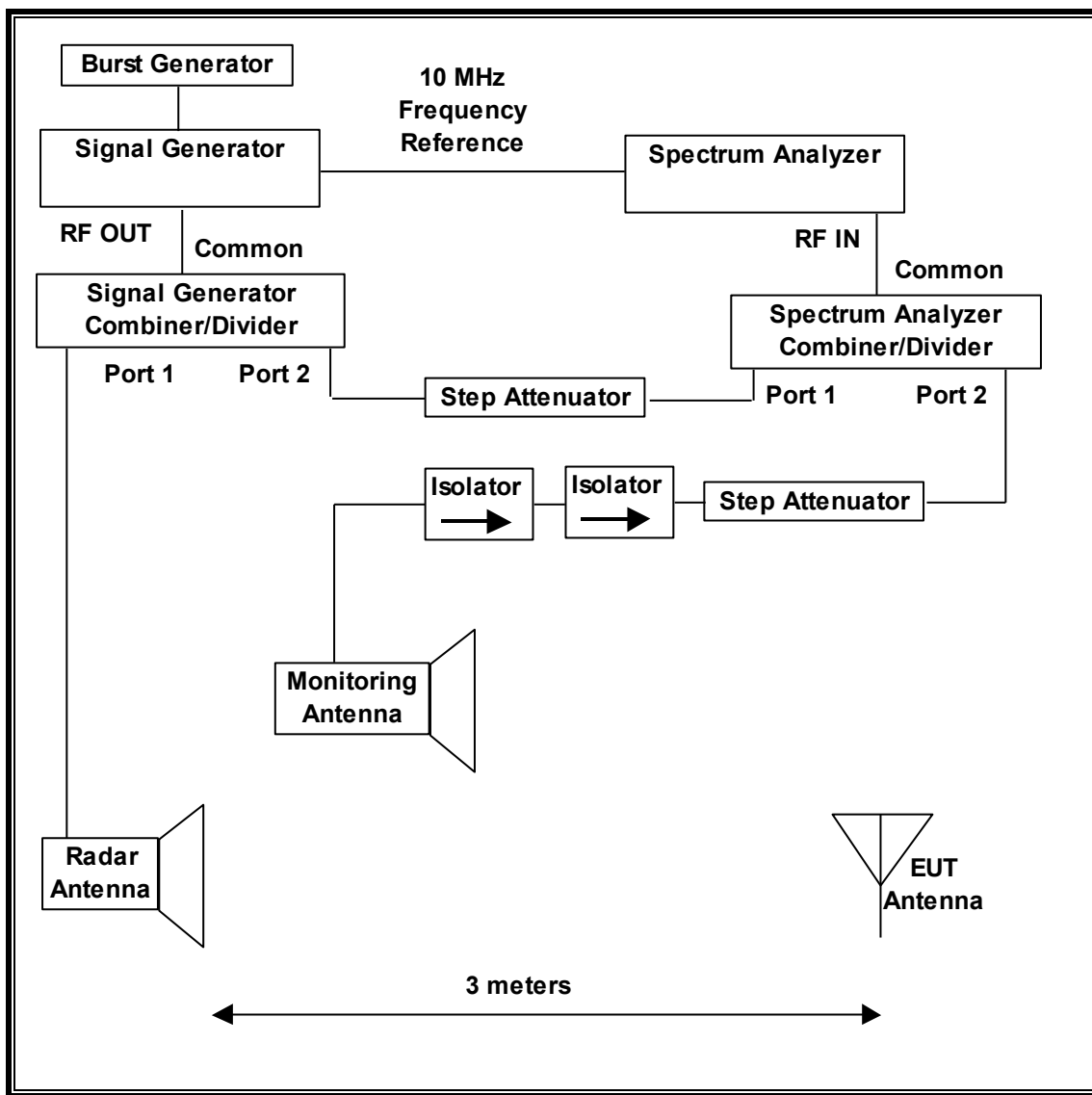
Radar Waveform Type	Pulse Width (μsec)	Chirp Width (MHz)	PRI (μsec)	Pulses per Burst	Number of Bursts	Minimum Percentage of Successful Detection	Minimum Trials
5	50-100	5-20	1000-2000	1-3	8-20	80%	30

Table 7 – Frequency Hopping Radar Test Signal

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

14.1.2. TEST AND MEASUREMENT SYSTEM

RADIATED METHOD SYSTEM BLOCK DIAGRAM



SYSTEM OVERVIEW

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

The short pulse types 1, 2, 3 and 4, and the long pulse type 5 parameters are randomized at run-time.

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

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

SYSTEM CALIBRATION

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

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

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

ADJUSTMENT OF DISPLAYED TRAFFIC LEVEL

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

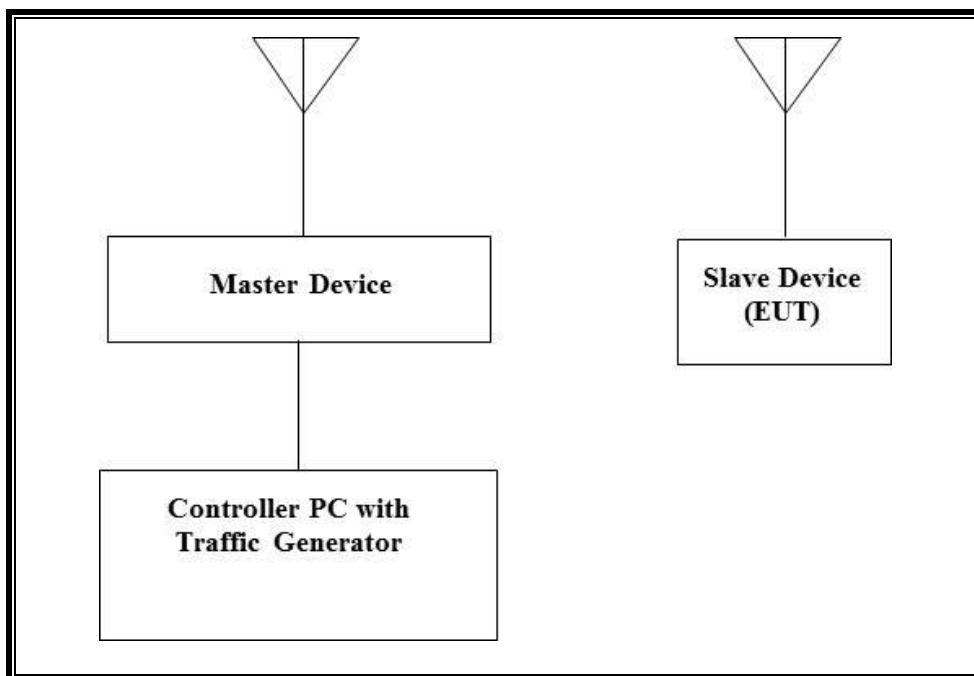
TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	Asset Number	Cal Due
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01178	09/05/15
Vector Signal Generator, 20GHz	Agilent / HP	E8267C	C01066	09/03/15
Arbitrary Waveform Generator	Agilent / HP	33220A	C01146	04/08/16

14.1.3. SETUP OF EUT

RADIATED METHOD EUT TEST SETUP



SUPPORT EQUIPMENT

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

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
802.11ac Dual Band Wireless Access Point (Master Device)	Cisco	AIR-CAP3702E-A-K9	FTX181570A6	LDK102087
P.O.E. Injector (Master)	Phihong	POE30U-560(G)	PHI170102N2	DoC
Notebook PC (Controller)	Lenovo	Type 4236-B92	PB-HEX04 12/05	DoC
AC Adapter (Controller PC)	Lenovo	42T4418	11S42T4418Z1ZGWG08 R90M	DoC

14.1.4. DESCRIPTION OF EUT

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

For IC the EUT operates over the 5250-5350 MHz and 5470-5725 MHz ranges, excluding the 5600-5650 MHz range.

The EUT is a Slave Device without Radar Detection.

The highest power level within these bands is 15.55 dBm EIRP in the 5250-5350 MHz band and 15.52 dBm EIRP in the 5470-5725 MHz band.

The antenna assembly utilized with the EUT has a gain of 2.7 dBi in the 5250-5350 MHz band and 2.4 dBi in the 5470-5725 MHz band.

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

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

The EUT uses one transmitter/receiver chain to perform radiated tests.

WLAN traffic that meets or exceeds the minimum required loading was generated by transferring a data stream from the controller/server PC to the EUT using iPerf version 2.0.5 software package.

The highest effective channel loading percentage is 8%.

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

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

The software installed in the EUT is Android version 4.4.4.

UNIFORM CHANNEL SPREADING

This is requirement not applicable to Slave Devices.

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

The Master Device is a Cisco Access Point, FCC ID: LDK102087. The minimum antenna gain for the Master Device is 6 dBi.

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

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

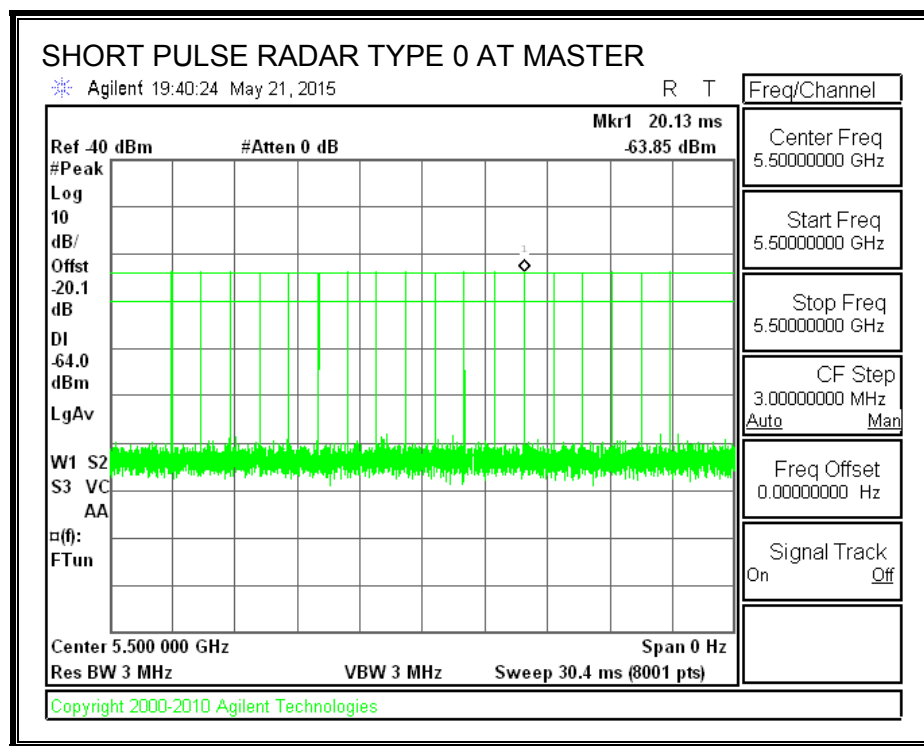
14.2. RESULTS FOR 20 MHz BANDWIDTH

14.2.1. TEST CHANNEL

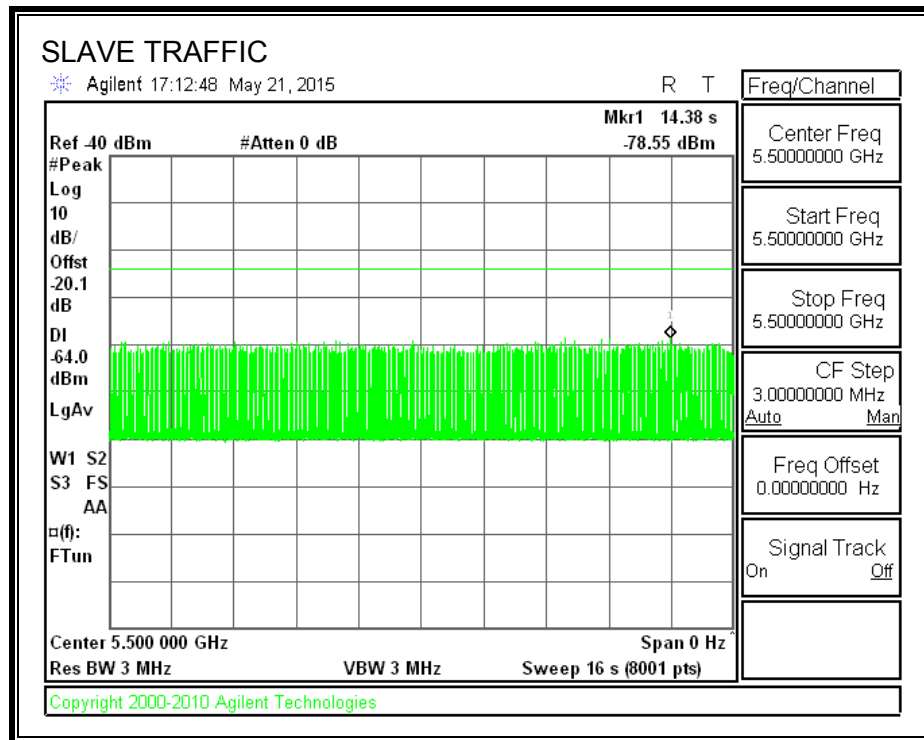
All tests were performed at a channel center frequency of 5500 MHz.

14.2.2. RADAR WAVEFORM AND TRAFFIC

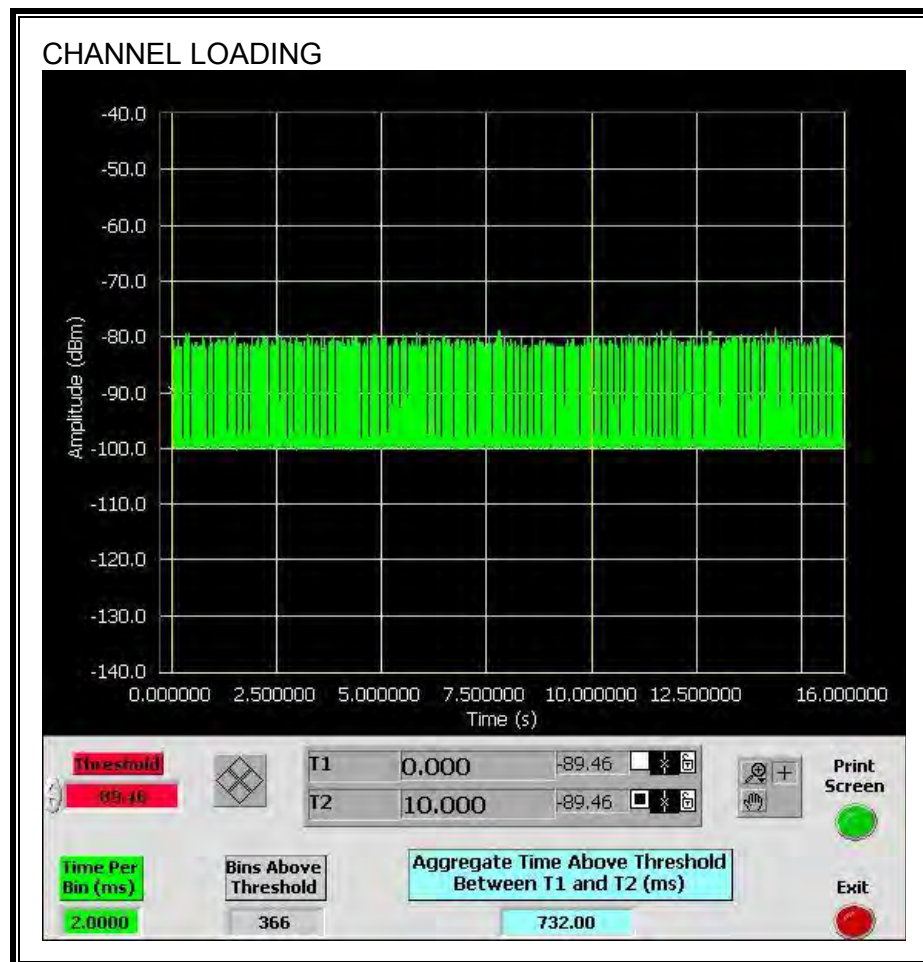
RADAR WAVEFORM



TRAFFIC



CHANNEL LOADING



The level of traffic loading on the channel by the EUT is 7.32%

14.2.3. OVERLAPPING CHANNEL TESTS

RESULTS

These tests are not applicable.

14.2.4. MOVE AND CLOSING TIME

REPORTING NOTES

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

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

The aggregate channel closing transmission time is calculated as follows:

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

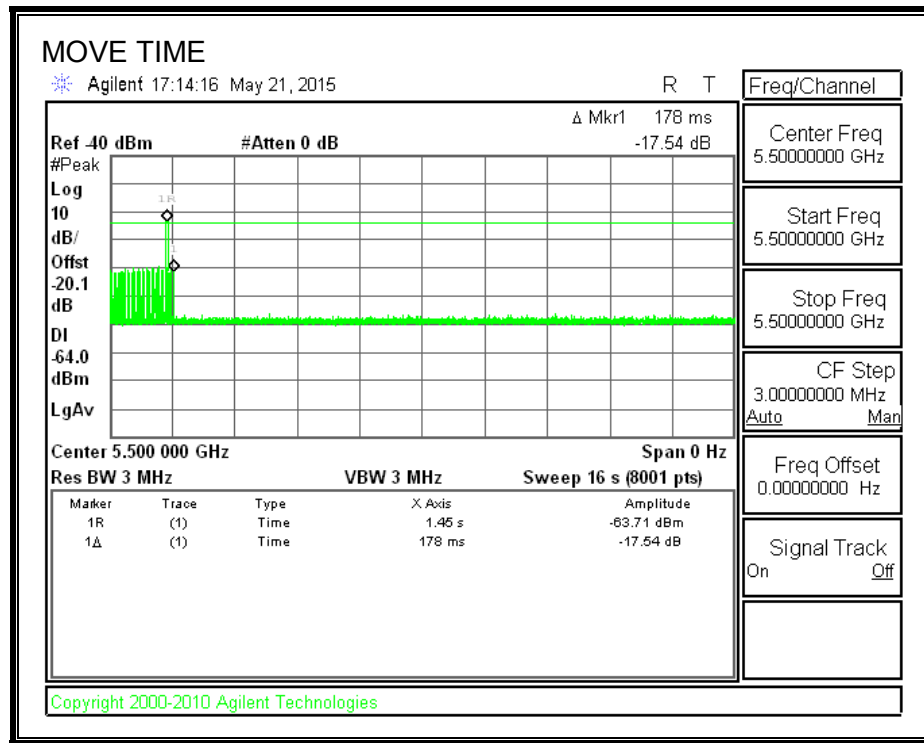
The observation period over which the aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

RESULTS

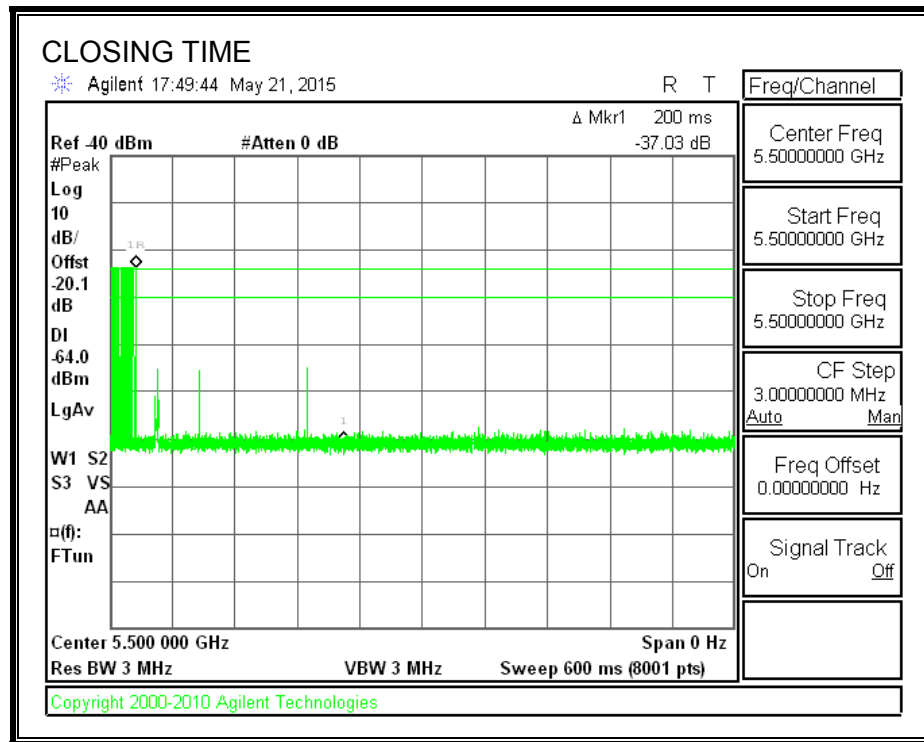
Channel Move Time (sec)	Limit (sec)
0.178	10

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

MOVE TIME

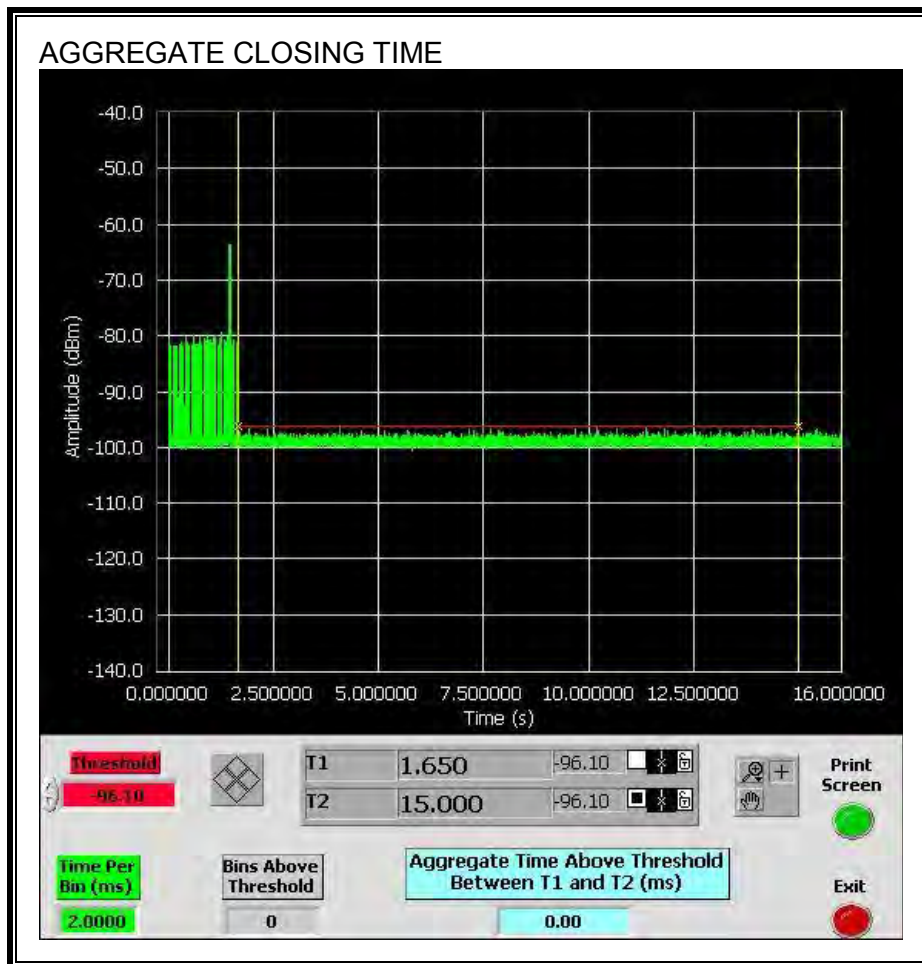


CHANNEL CLOSING TIME



AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

No transmissions are observed during the aggregate monitoring period.



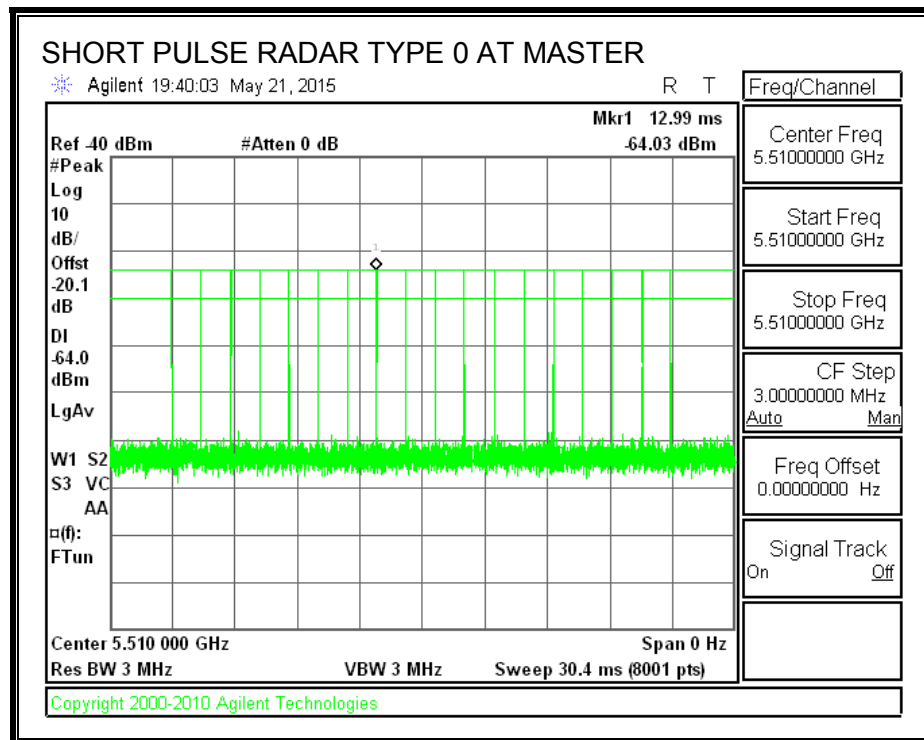
14.3. RESULTS FOR 40 MHz BANDWIDTH

14.3.1. TEST CHANNEL

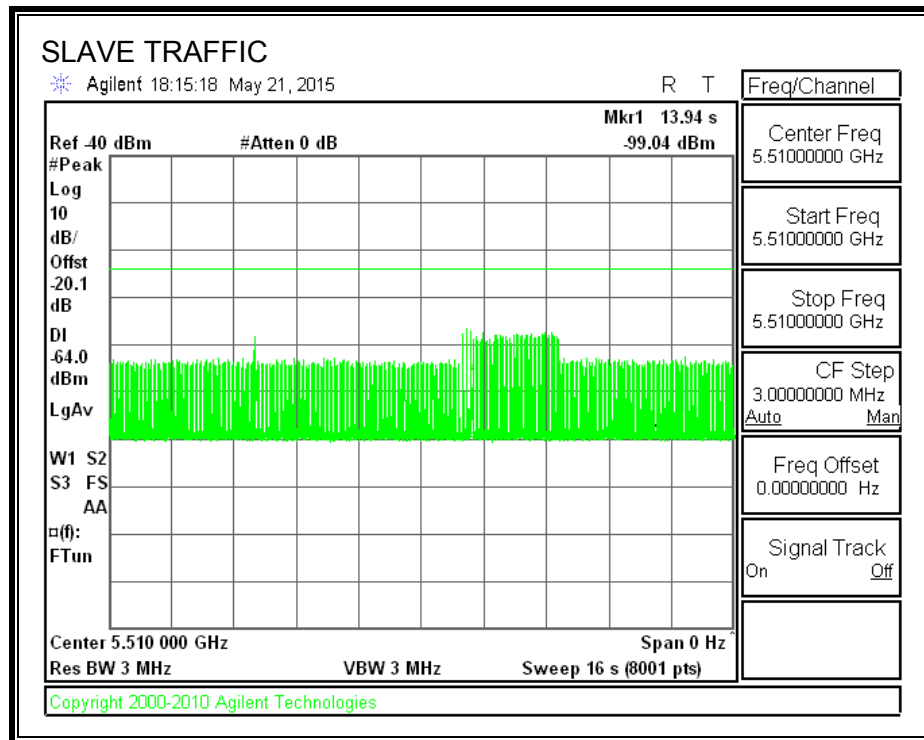
All tests were performed at a channel center frequency of 5510 MHz.

14.3.2. RADAR WAVEFORM AND TRAFFIC

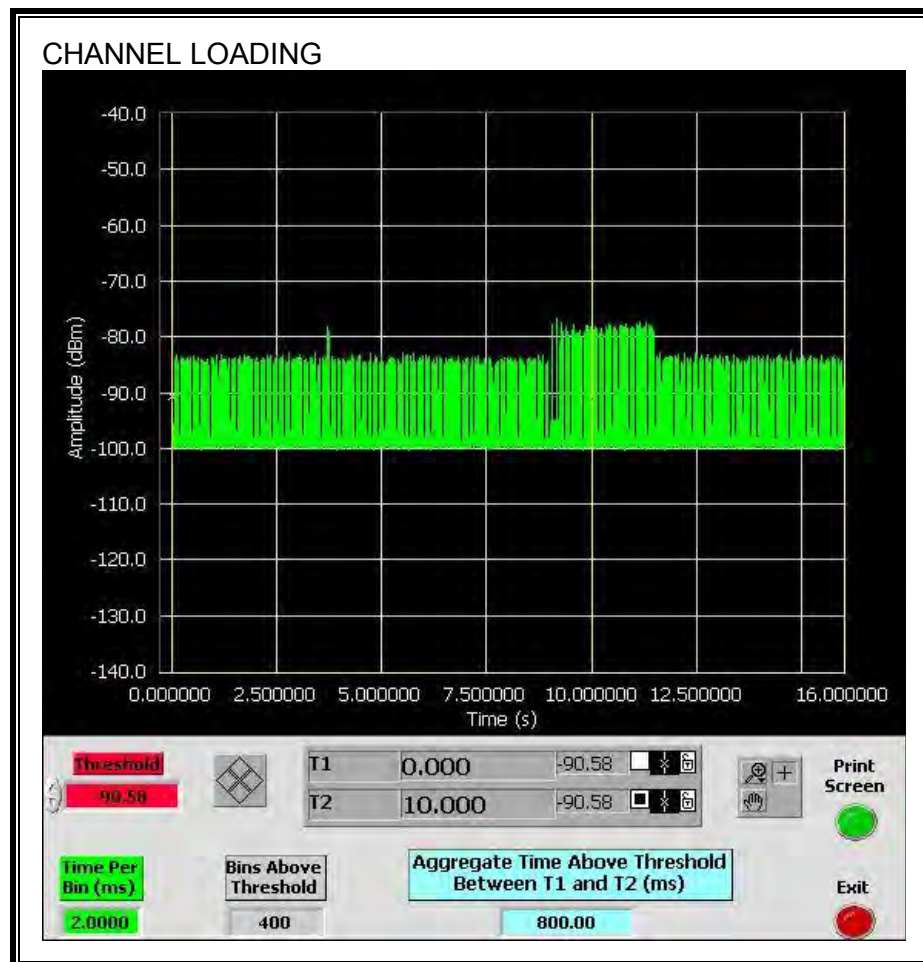
RADAR WAVEFORM



TRAFFIC



CHANNEL LOADING



The level of traffic loading on the channel by the EUT is 8%

14.3.3. OVERLAPPING CHANNEL TESTS

RESULTS

These tests are not applicable.

14.3.4. MOVE AND CLOSING TIME

REPORTING NOTES

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

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

The aggregate channel closing transmission time is calculated as follows:

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

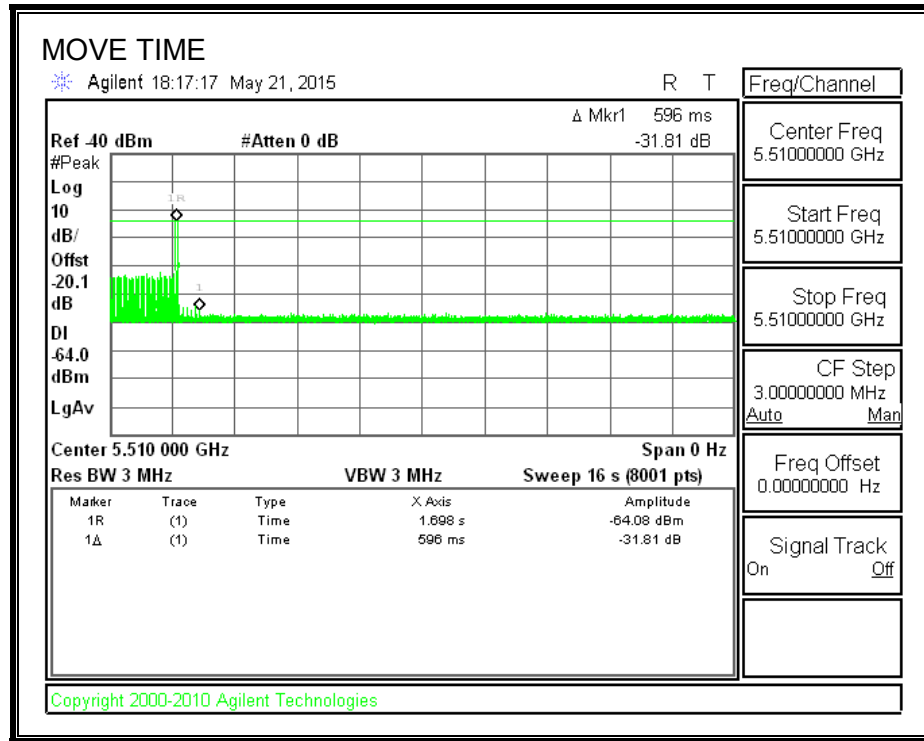
The observation period over which the aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

RESULTS

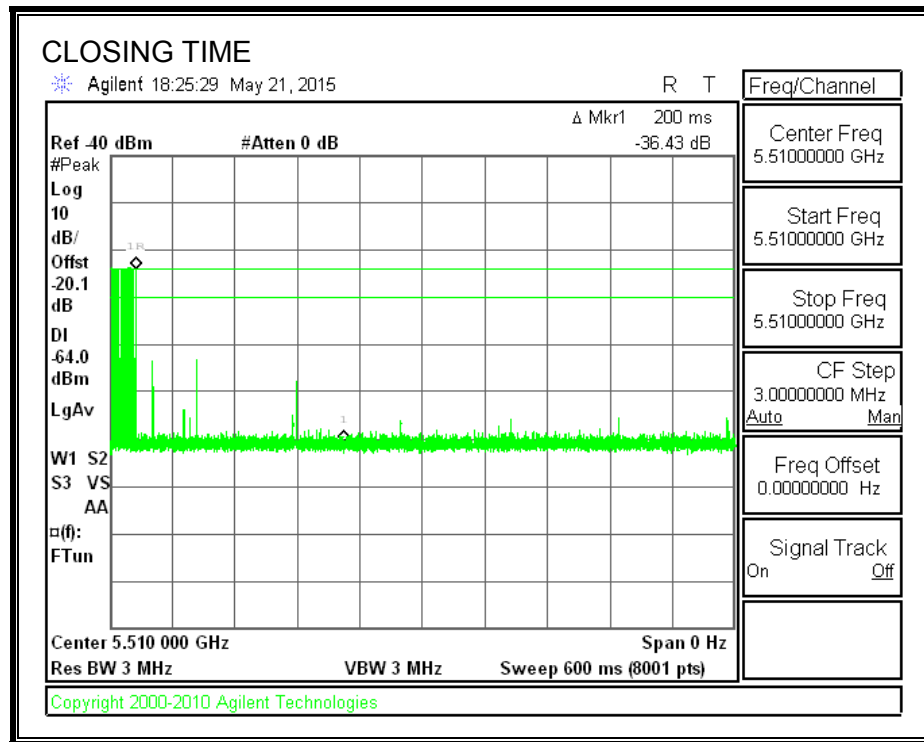
Channel Move Time (sec)	Limit (sec)
0.596	10

Aggregate Channel Closing Transmission Time (msec)	Limit (msec)
10.0	60

MOVE TIME

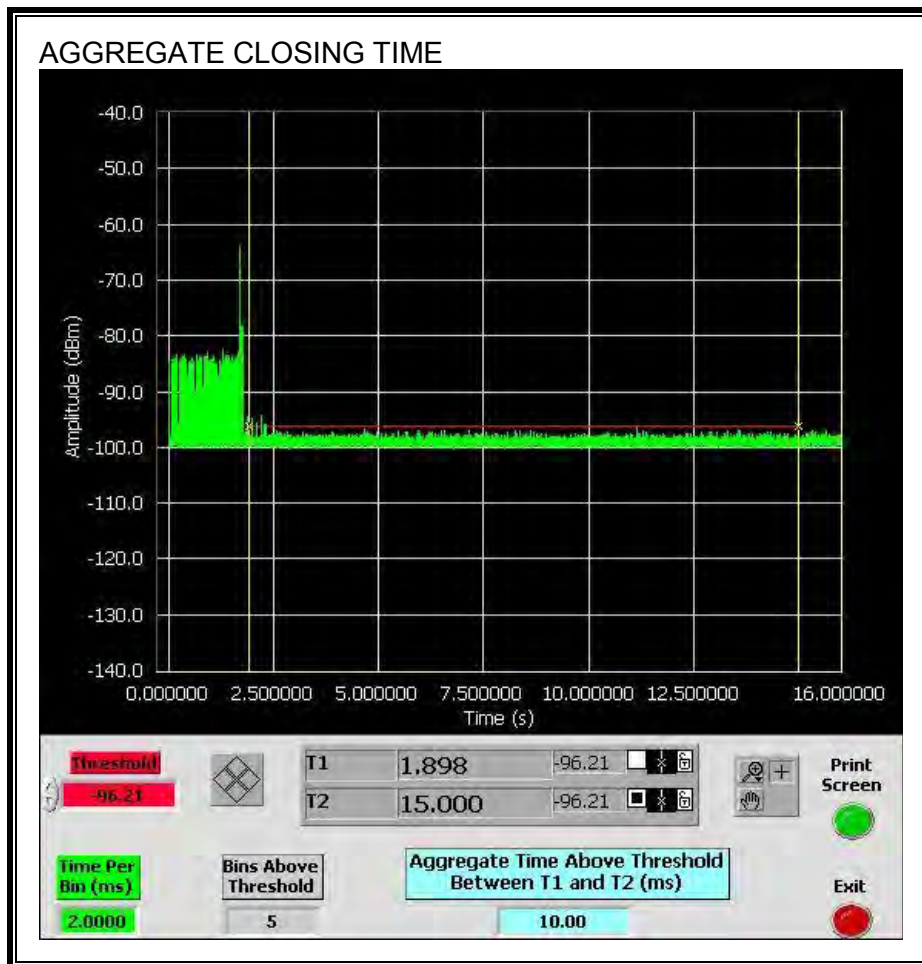


CHANNEL CLOSING TIME



AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

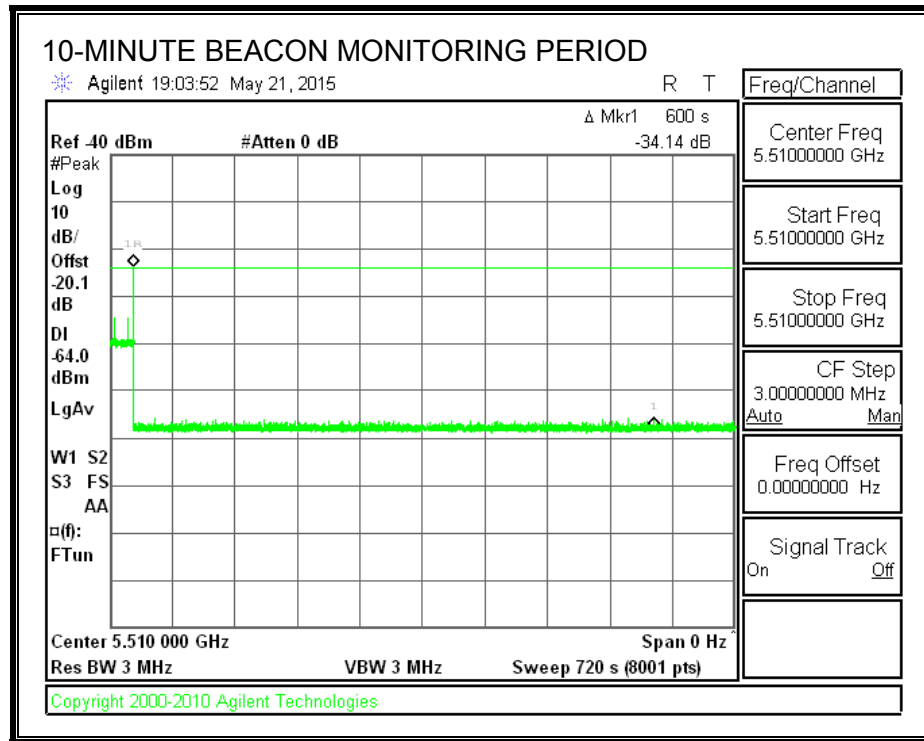
Only intermittent transmissions are observed during the aggregate monitoring period.



14.3.5. 10-MINUTE BEACON MONITORING PERIOD

RESULTS

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



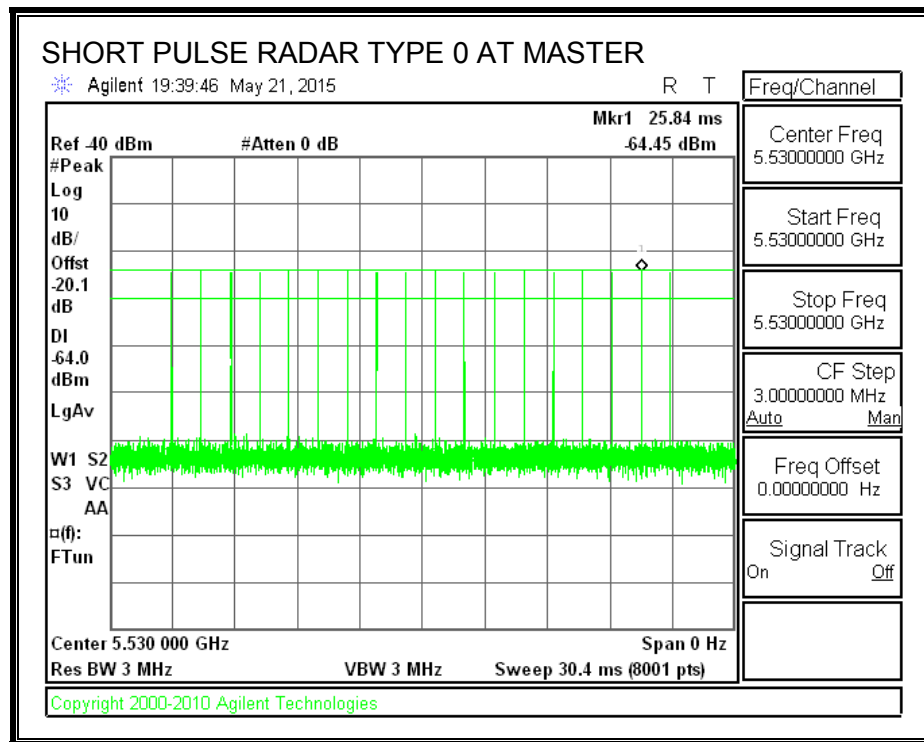
14.4. RESULTS FOR 80 MHz BANDWIDTH

14.4.1. TEST CHANNEL

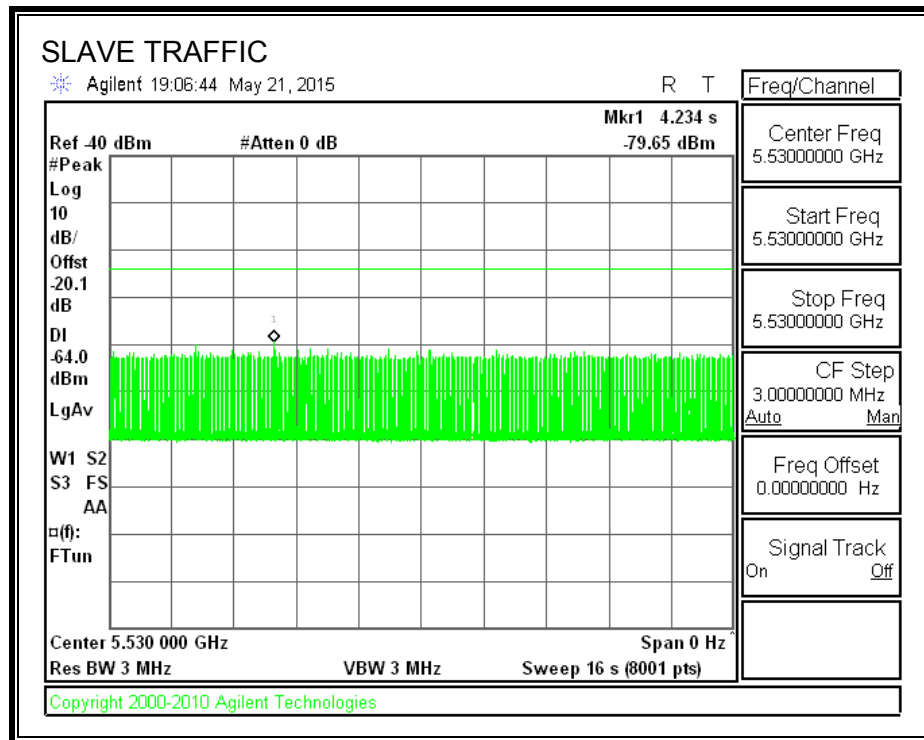
All tests were performed at a channel center frequency of 5530 MHz.

14.4.2. RADAR WAVEFORM AND TRAFFIC

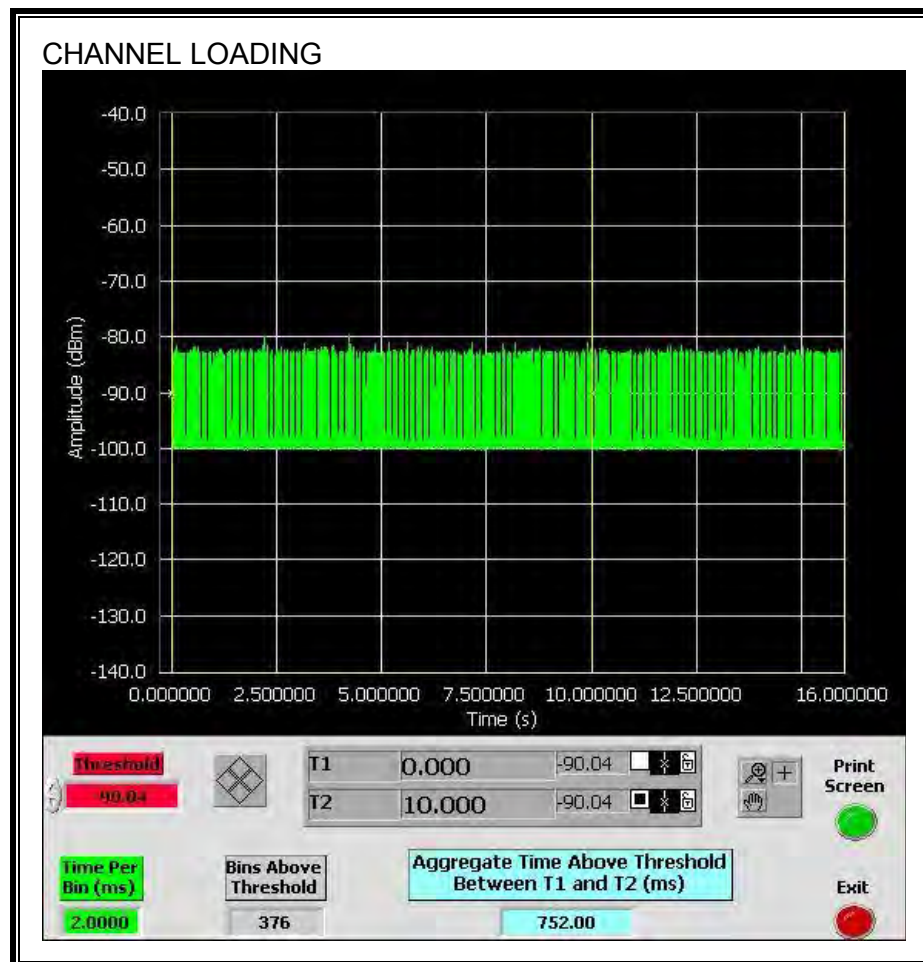
RADAR WAVEFORM



TRAFFIC



CHANNEL LOADING



The level of traffic loading on the channel by the EUT is 7.52%

14.4.3. OVERLAPPING CHANNEL TESTS

RESULTS

These tests are not applicable.

14.4.4. MOVE AND CLOSING TIME

REPORTING NOTES

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

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

The aggregate channel closing transmission time is calculated as follows:

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

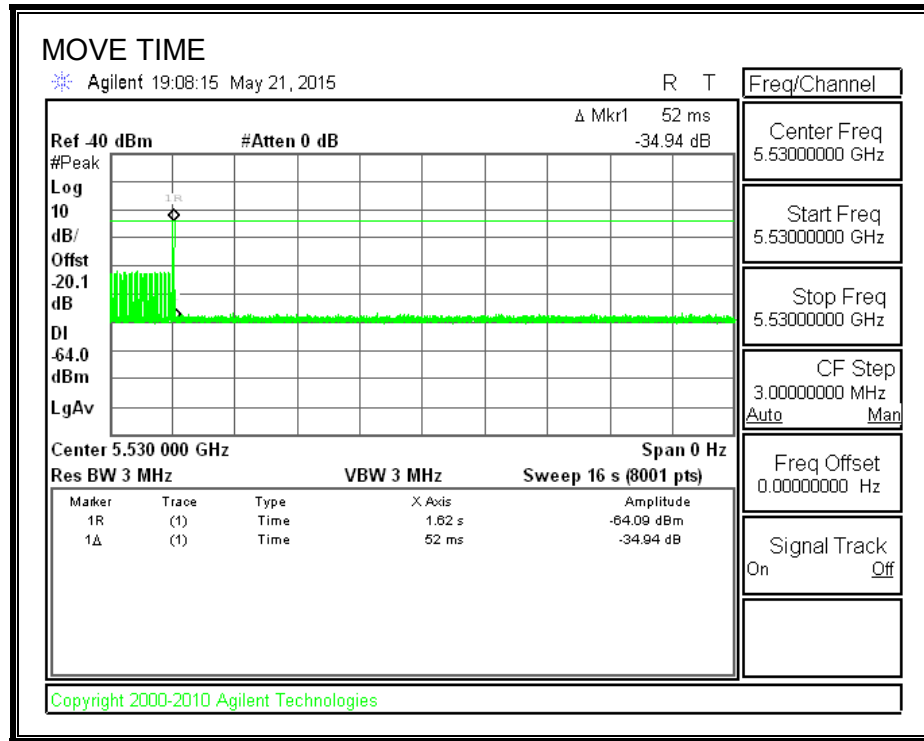
The observation period over which the aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

RESULTS

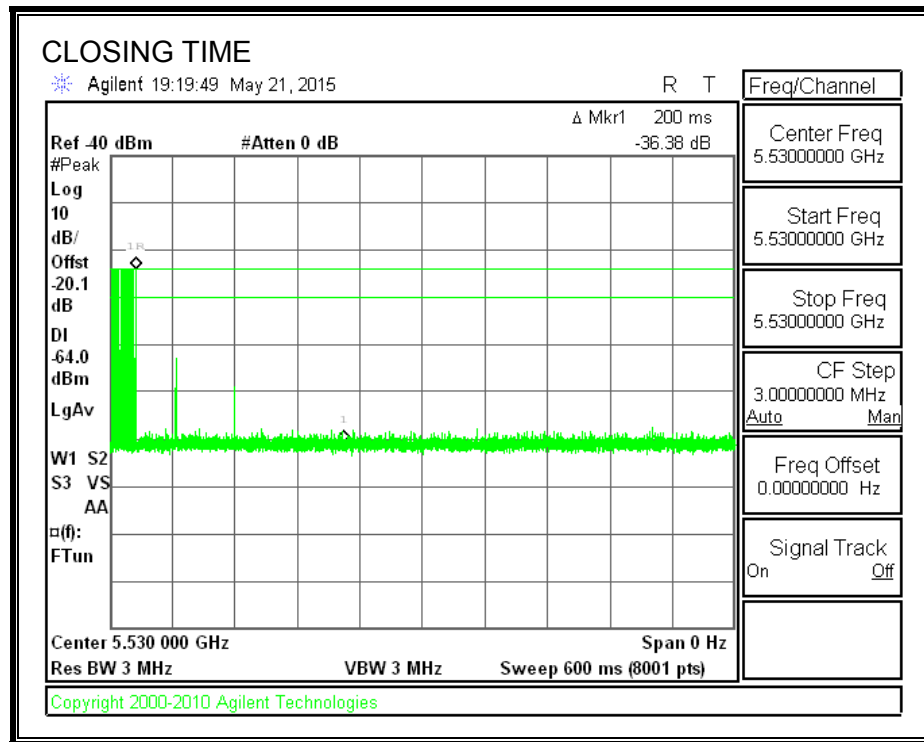
Channel Move Time (sec)	Limit (sec)
0.052	10

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

MOVE TIME

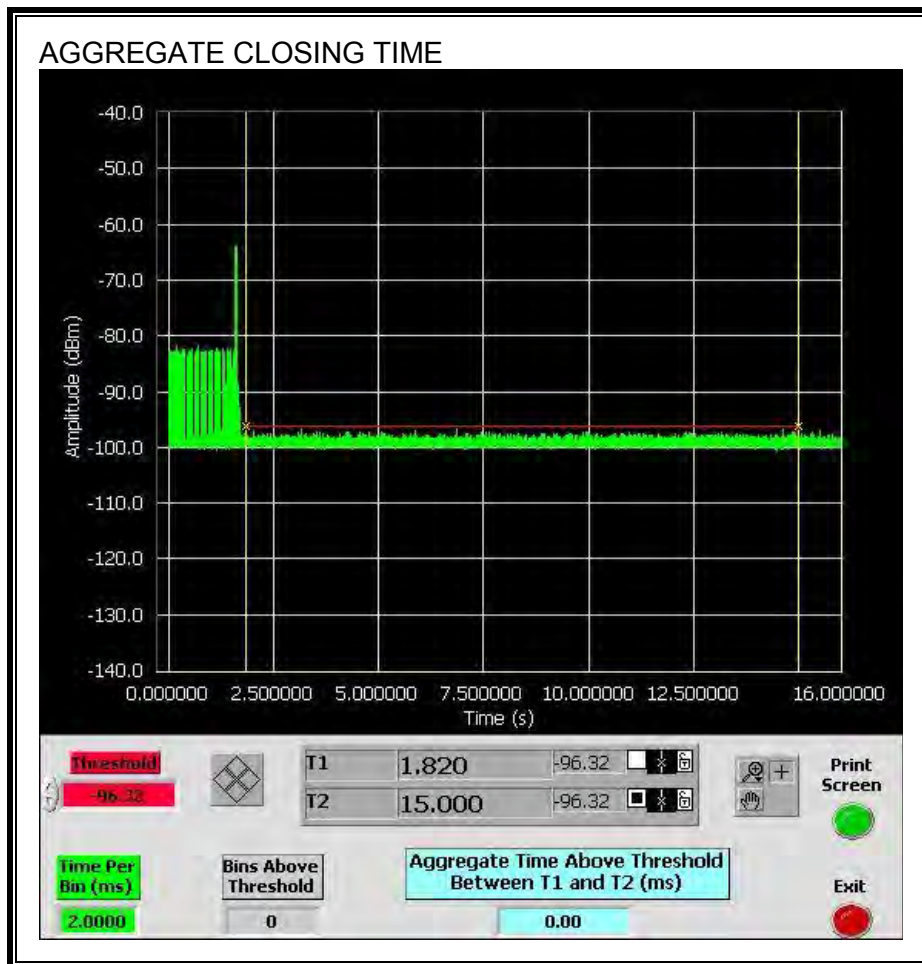


CHANNEL CLOSING TIME



AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

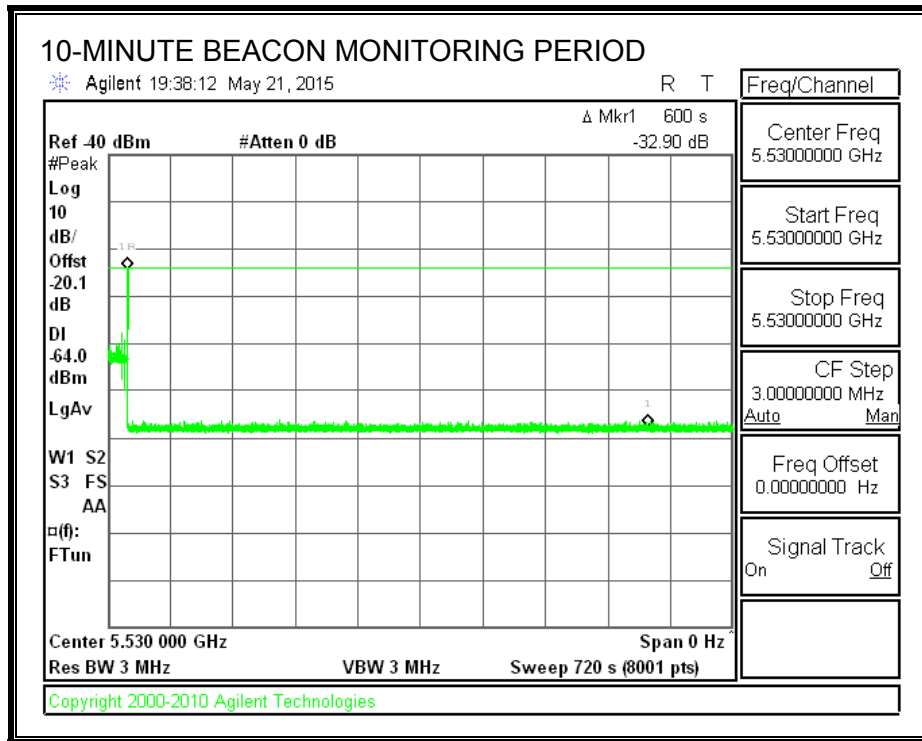
No transmissions are observed during the aggregate monitoring period.



14.4.5. 10-MINUTE BEACON MONITORING PERIOD

RESULTS

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



15. DYNAMIC FREQUENCY SELECTION - Window Based

15.1. OVERVIEW

15.1.1. LIMITS

INDUSTRY CANADA

IC RSS-210 is closely harmonized with FCC Part 15 DFS rules. The deviations are as follows:

RSS-210 Issue 8 A9.3

Note: For the band 5600–5650 MHz, no operation is permitted.

Until further notice, devices subject to this annex shall not be capable of transmitting in the band 5600–5650 MHz. This restriction is for the protection of Environment Canada weather radars operating in this band.

FCC

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

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

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

Table 2: Applicability of DFS requirements during normal operation

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

Additional requirements for devices with multiple bandwidth modes	Master Device or Client with Radar DFS	Client (without DFS)
<i>U-NII Detection Bandwidth and Statistical Performance Check</i>	All BW modes must be tested	Not required
<i>Channel Move Time and Channel Closing Transmission Time</i>	Test using widest BW mode available	Test using the widest BW mode available for the link
<i>All other tests</i>	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 all 20 MHz channel blocks and a null frequency between the bonded 20 MHz channel blocks.		

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

Maximum Transmit Power	Value (see notes)
E.I.R.P. $\geq$ 200 mill watt	-64 dBm
E.I.R.P. < 200 mill watt and power spectral density < 10 dBm/MHz	-62 dBm
E.I.R.P. < 200 mill watt that do not meet power spectral density requirement	-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. Note 3: E.I.R.P. is based on the highest antenna gain. For MIMO devices refer to KDB publication 662911 D01.	

Table 4: DFS Response requirement values

Parameter	Value
<i>Non-occupancy period</i>	30 minutes
<i>Channel Availability Check Time</i>	60 seconds
<i>Channel Move Time</i>	10 seconds (See Note 1)
<i>Channel Closing Transmission Time</i>	200 milliseconds + approx. 60 milliseconds over remaining 10 second period. (See Notes 1 and 2)
<i>U-NII Detection Bandwidth</i>	Minimum 100% of the U- NII 99% transmission power bandwidth. (See Note 3)
Note 1: <i>Channel Move Time</i> and the <i>Channel Closing Transmission Time</i> should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst. Note 2: The <i>Channel Closing Transmission Time</i> is comprised of 200 milliseconds starting at the beginning of the <i>Channel Move Time</i> plus any additional intermittent control signals required to facilitate a <i>Channel</i> move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions. Note 3: During the <i>U-NII Detection Bandwidth</i> detection test, radar type 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.	

Table 5 – Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (usec)	PRI (usec)	Pulses	Minimum Percentage of Successful Detection	Minimum Trials
0	1	1428	18	See Note 1	See Note 1
1	1	Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in table 5a	Roundup: $\{(1/360) \times (19 \times 10^6 \text{ PRI}_{\text{usec}})\}$	60%	30
		Test B: 15 unique PRI values randomly selected within the range of 518-3066 usec. With a minimum increment of 1 usec, excluding PRI values selected in Test A			
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 <i>Detection Bandwidth</i> test, <i>Channel Move Time</i> , and <i>Channel Closing Time</i> tests.					

Table 6 – Long Pulse Radar Test Signal

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

Table 7 – Frequency Hopping Radar Test Signal

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

SYSTEM OVERVIEW

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

The short pulse types 1, 2, 3 and 4, and the long pulse type 5 parameters are randomized at run-time.

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

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

SYSTEM CALIBRATION

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

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

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

ADJUSTMENT OF DISPLAYED TRAFFIC LEVEL

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

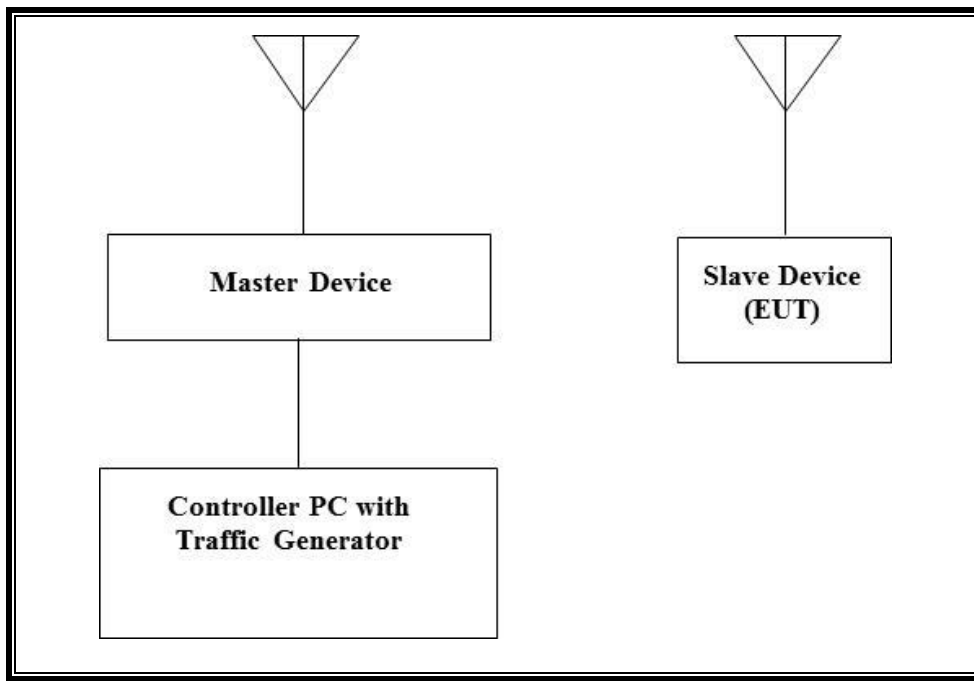
TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	Asset Number	Cal Due
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01178	09/05/15
Vector Signal Generator, 20GHz	Agilent / HP	E8267C	C01066	09/03/15
Arbitrary Waveform Generator	Agilent / HP	33220A	C01146	04/08/16

15.1.3. SETUP OF EUT

RADIATED METHOD EUT TEST SETUP



SUPPORT EQUIPMENT

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

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
802.11ac Dual Band Wireless Access Point (Master Device)	Cisco	AIR-CAP3702E-A-K9	FTX181570A6	LDK102087
P.O.E. Injector (Master)	Phihong	POE30U-560(G)	PHI170102N2	DoC
Notebook PC (Controller)	Lenovo	Type 4236-B92	PB-HEX04 12/05	DoC
AC Adapter (Controller PC)	Lenovo	42T4418	11S42T4418Z1ZGWWG08 R90M	DoC

15.1.4. DESCRIPTION OF EUT

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

For IC the EUT operates over the 5250-5350 MHz and 5470-5725 MHz ranges, excluding the 5600-5650 MHz range.

The EUT is a Slave Device without Radar Detection.

The highest power level within these bands is 15.55 dBm EIRP in the 5250-5350 MHz band and 15.52 dBm EIRP in the 5470-5725 MHz band.

The antenna assembly utilized with the EUT has a gain of 2.7 dBi in the 5250-5350 MHz band and 2.4 dBi in the 5470-5725 MHz band.

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

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

The EUT uses one transmitter/receiver chain to perform radiated tests.

WLAN traffic is generated by streaming the video file TestFile 841MB.wmv "6 ½ Magic Hours" from the Master to the Slave in full motion video mode using Microsoft Xbox Video Version 2.5.3995.0

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

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

The software installed in the EUT is Windows Embedded 8.1 Handheld Update 2.

UNIFORM CHANNEL SPREADING

This is requirement not applicable to Slave Devices.

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

The Master Device is a Cisco Access Point, FCC ID: LDK102087. The minimum antenna gain for the Master Device is 6 dBi.

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

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

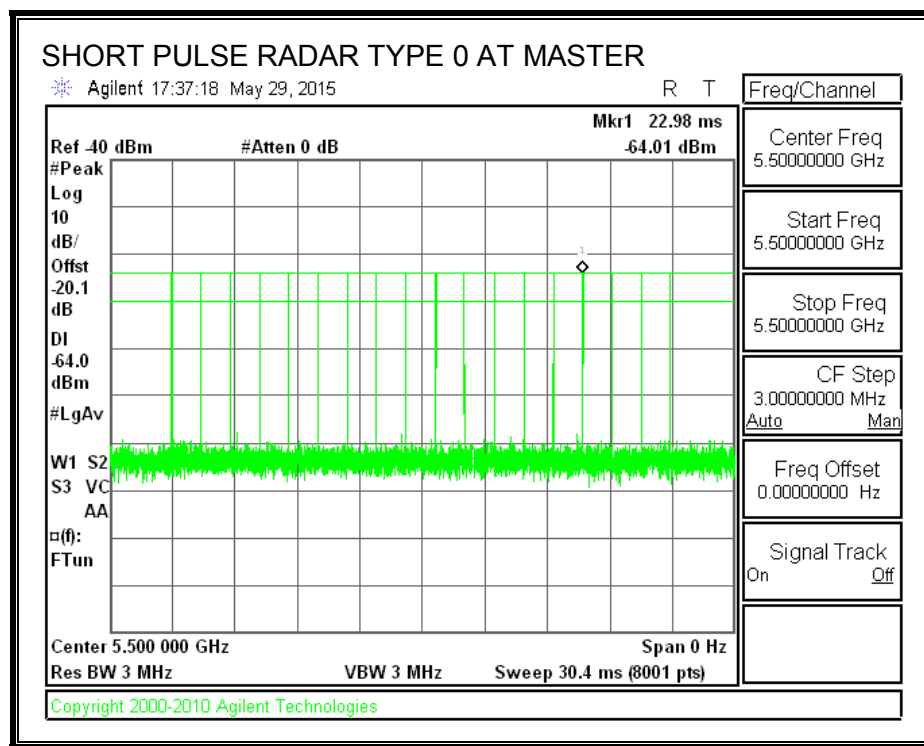
15.2. RESULTS FOR 20 MHz BANDWIDTH

15.2.1. TEST CHANNEL

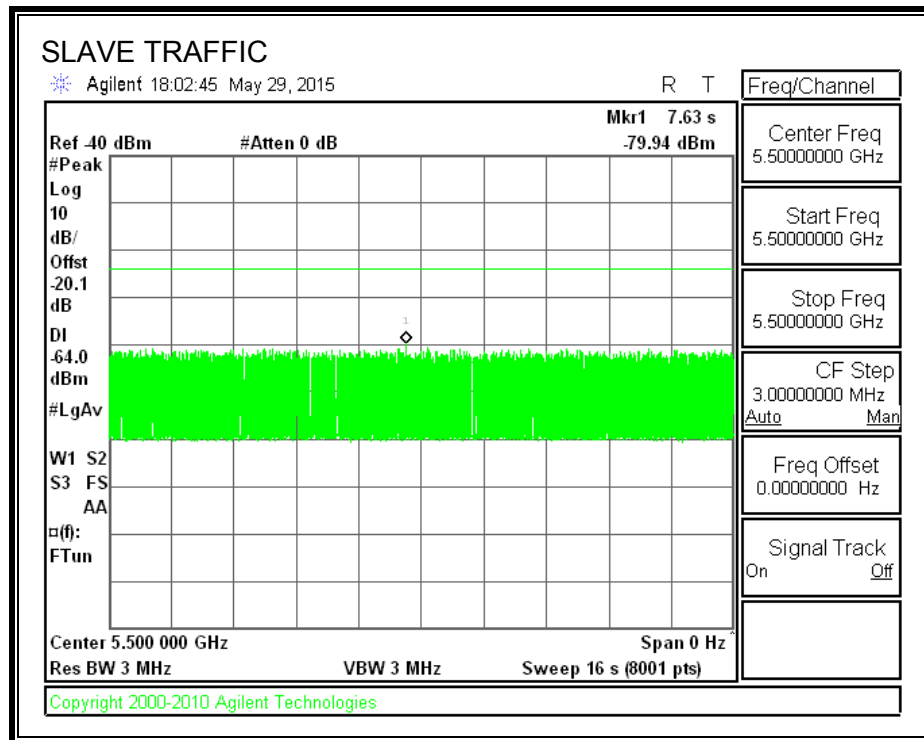
All tests were performed at a channel center frequency of 5500 MHz.

15.2.2. RADAR WAVEFORM AND TRAFFIC

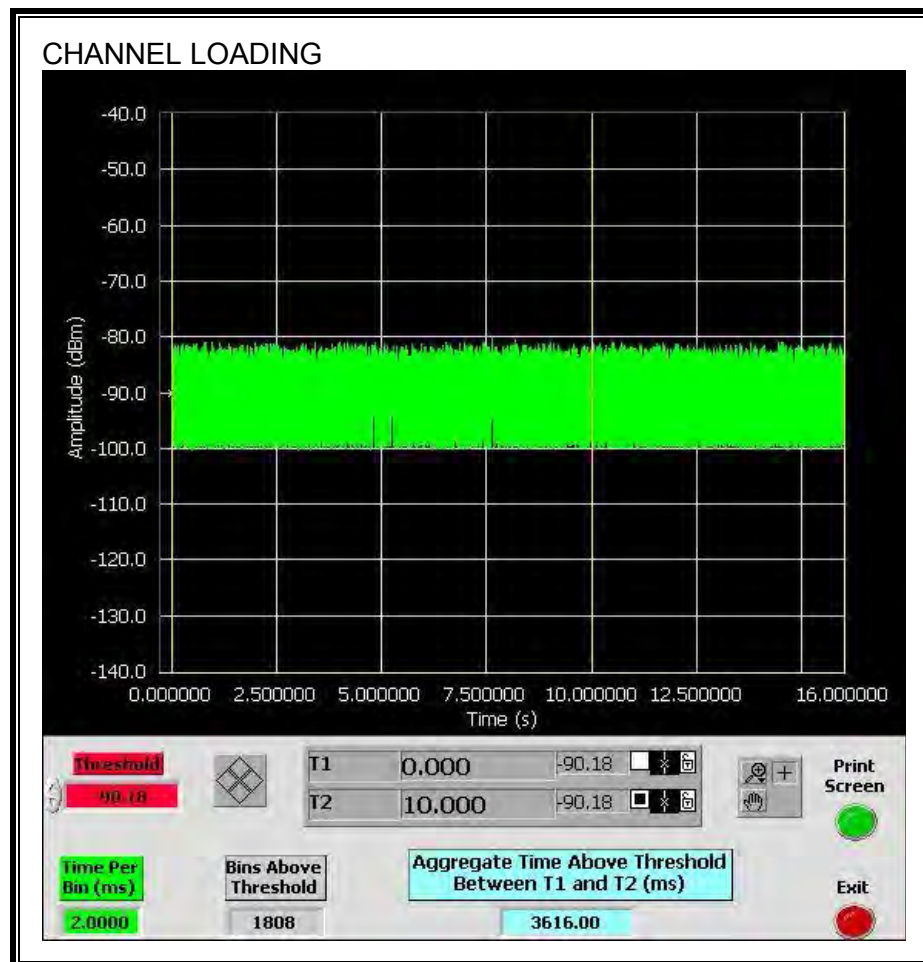
RADAR WAVEFORM



TRAFFIC



CHANNEL LOADING



The level of traffic loading on the channel by the EUT is 36.16%

15.2.3. OVERLAPPING CHANNEL TESTS

RESULTS

These tests are not applicable.

15.2.4. MOVE AND CLOSING TIME

REPORTING NOTES

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

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

The aggregate channel closing transmission time is calculated as follows:

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

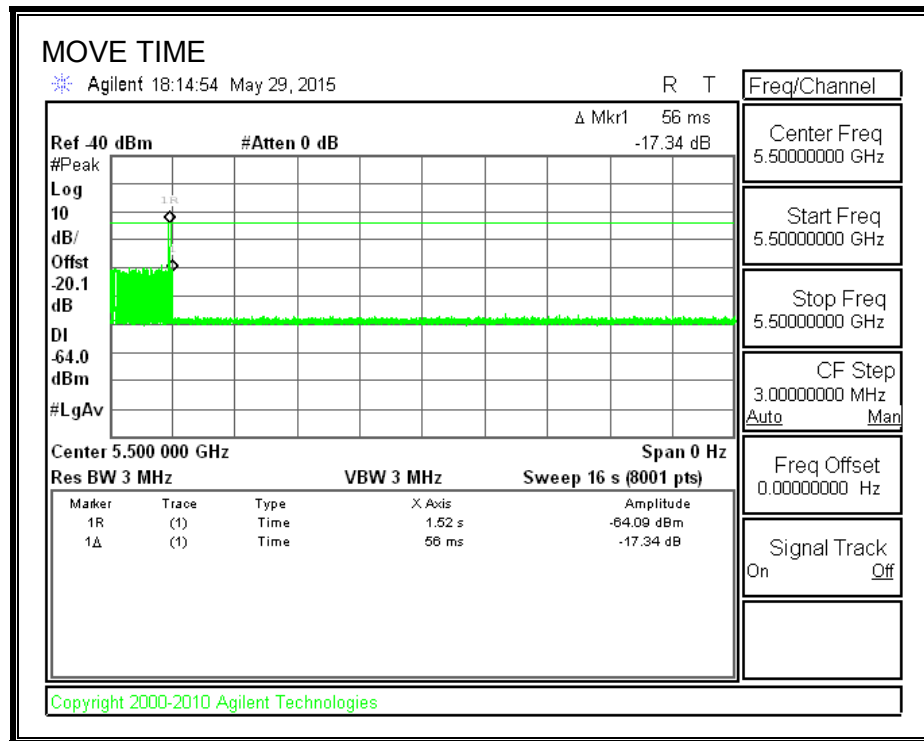
The observation period over which the aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

RESULTS

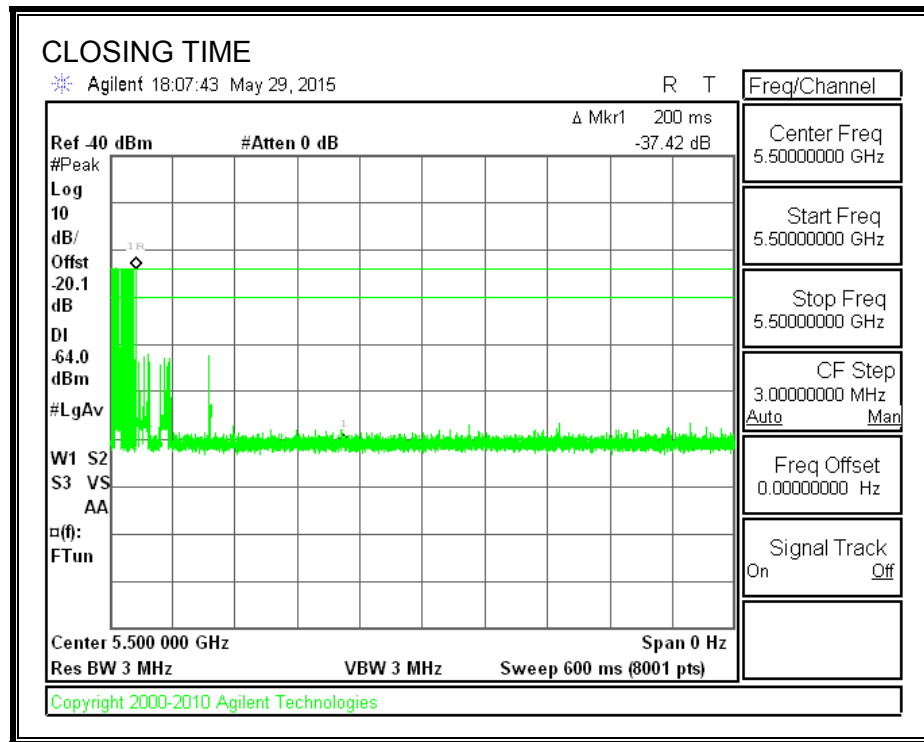
Channel Move Time (sec)	Limit (sec)
0.056	10

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

MOVE TIME

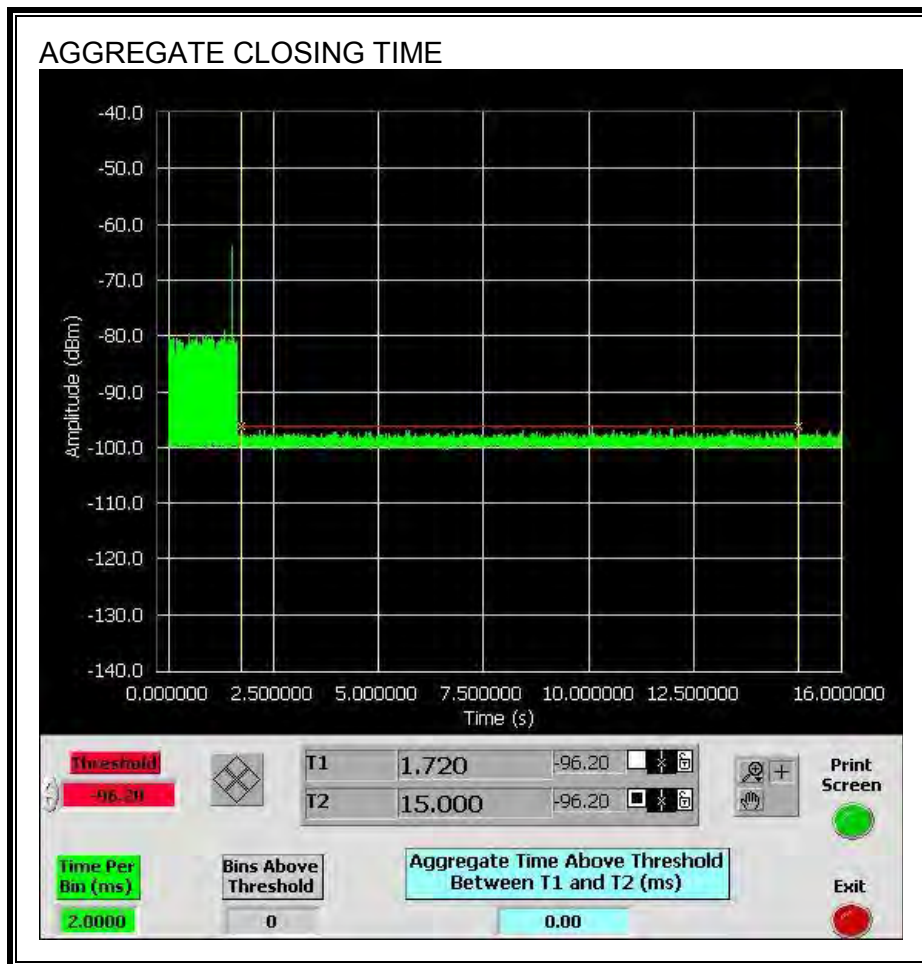


CHANNEL CLOSING TIME



AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

No transmissions are observed during the aggregate monitoring period.



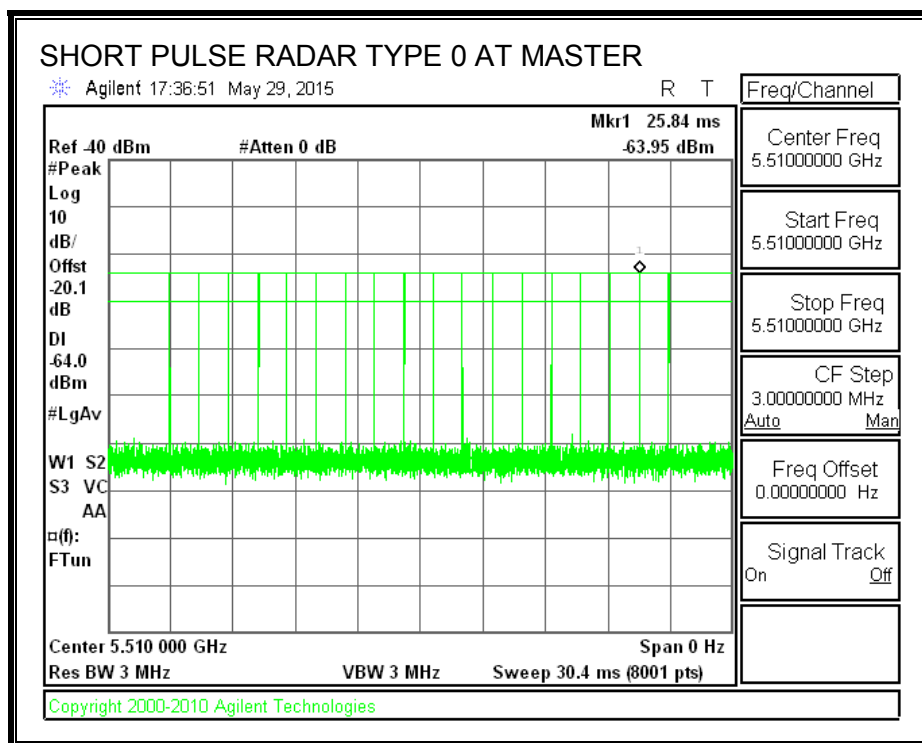
15.3. RESULTS FOR 40 MHz BANDWIDTH

15.3.1. TEST CHANNEL

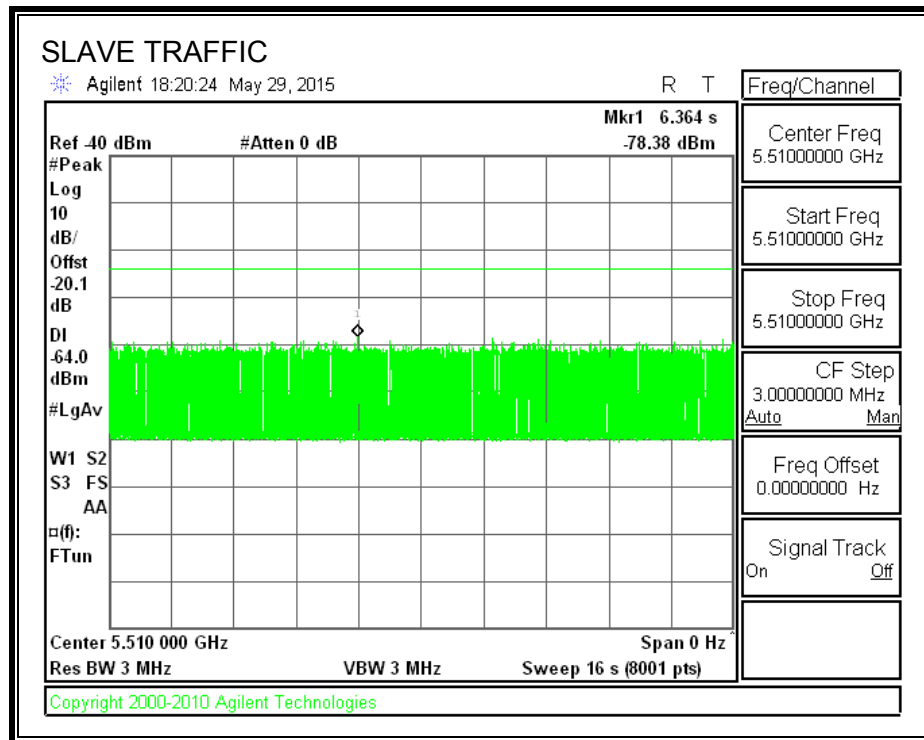
All tests were performed at a channel center frequency of 5510 MHz.

15.3.2. RADAR WAVEFORM AND TRAFFIC

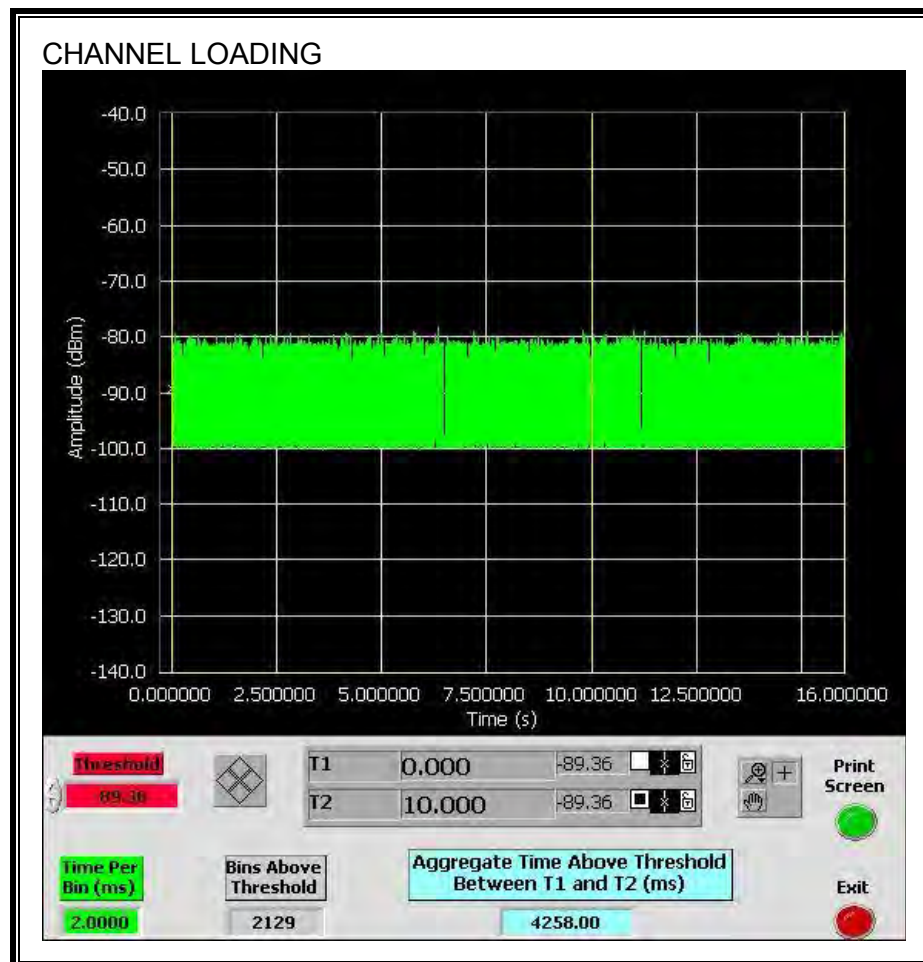
RADAR WAVEFORM



TRAFFIC



CHANNEL LOADING



The level of traffic loading on the channel by the EUT is 42.58%

15.3.3. OVERLAPPING CHANNEL TESTS

RESULTS

These tests are not applicable.

15.3.4. MOVE AND CLOSING TIME

REPORTING NOTES

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

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

The aggregate channel closing transmission time is calculated as follows:

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

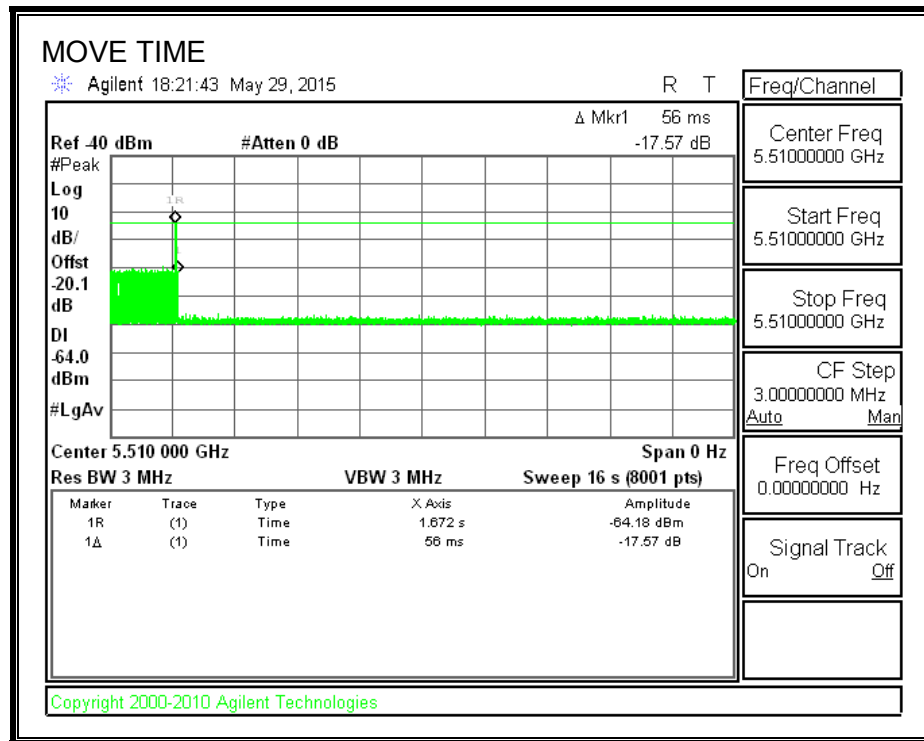
The observation period over which the aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

RESULTS

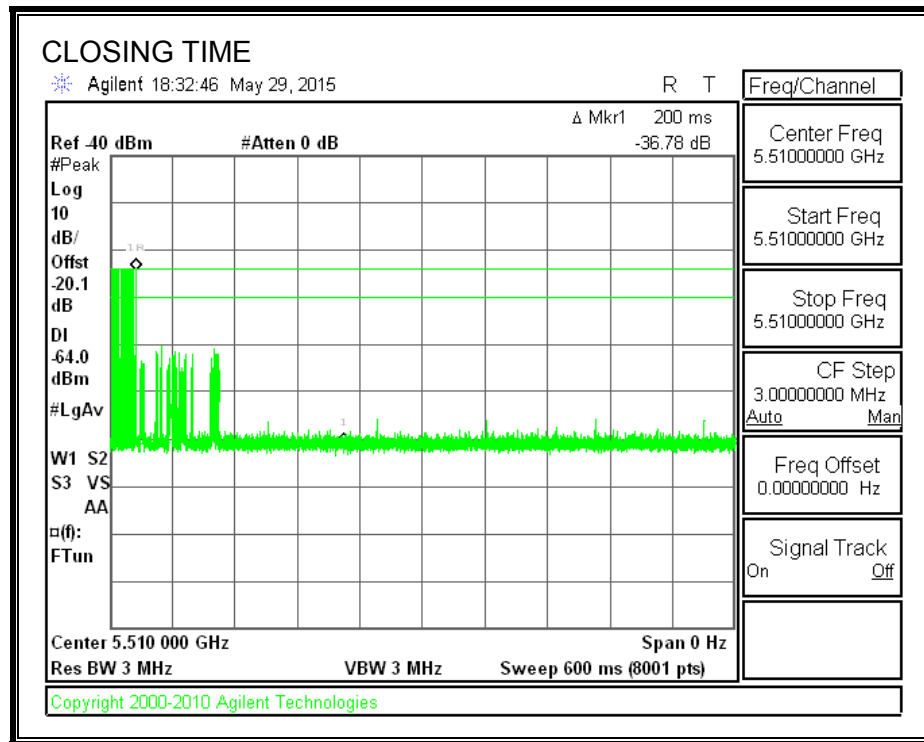
Channel Move Time (sec)	Limit (sec)
0.056	10

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

MOVE TIME

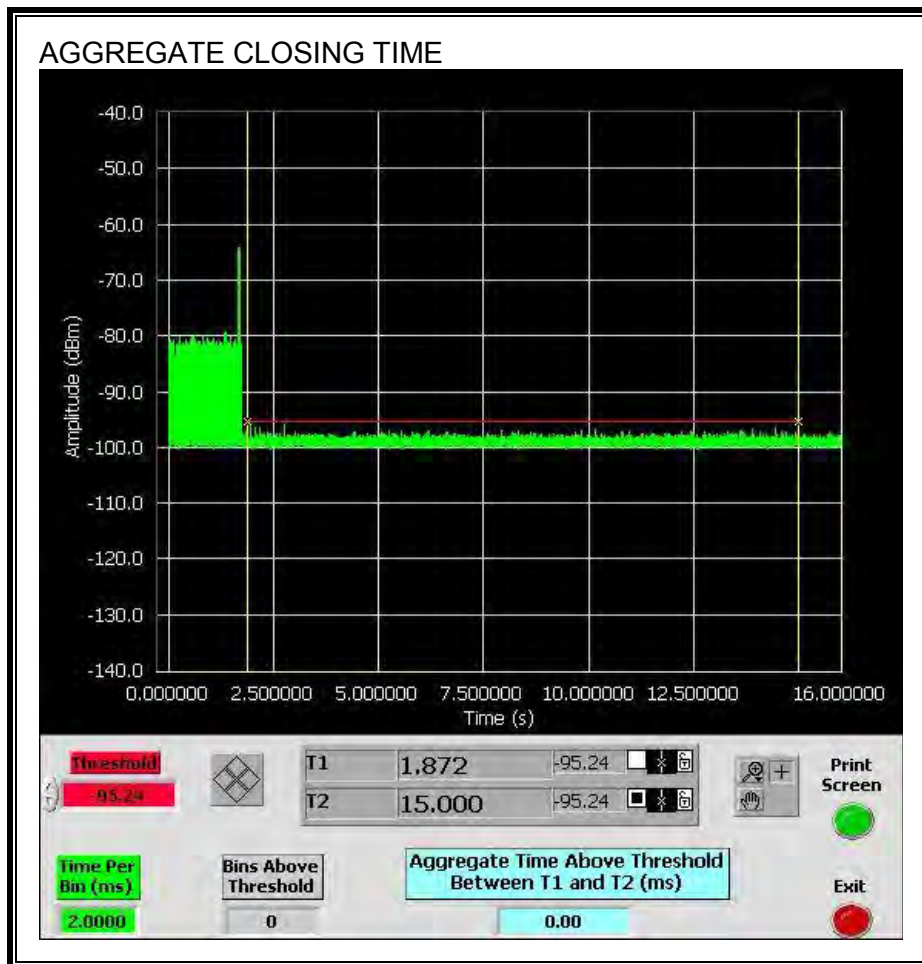


CHANNEL CLOSING TIME



AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

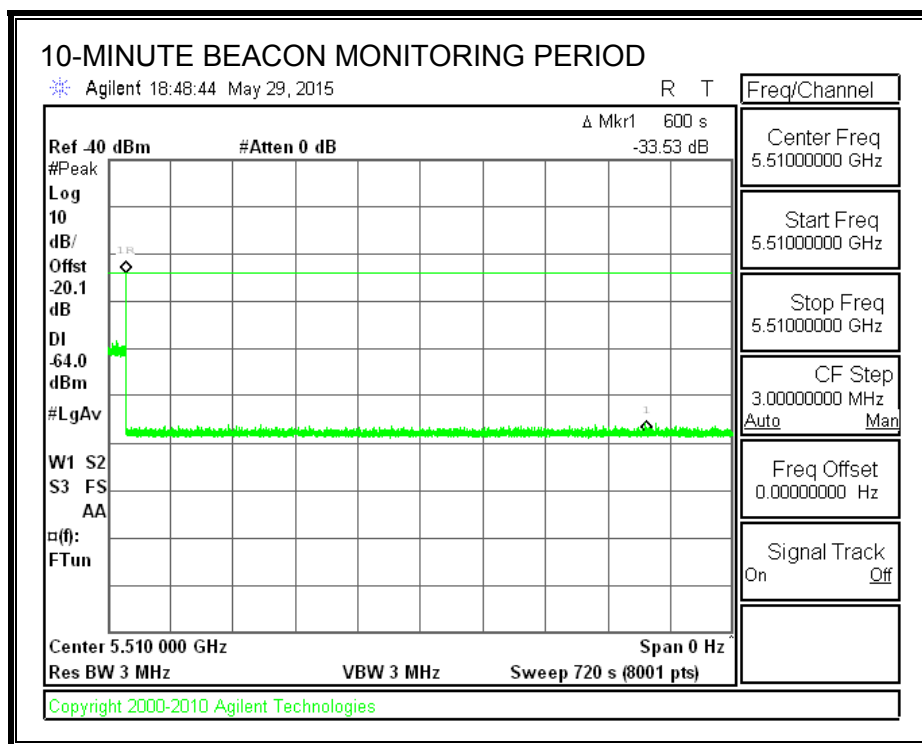
No transmissions are observed during the aggregate monitoring period.



15.3.5. 10-MINUTE BEACON MONITORING PERIOD

RESULTS

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



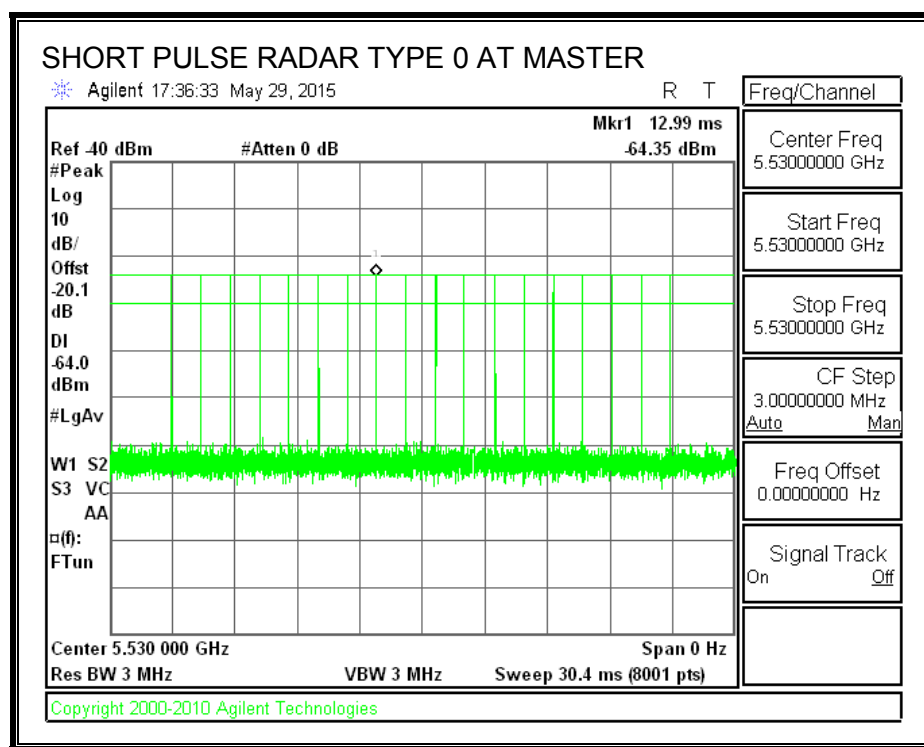
15.4. RESULTS FOR 80 MHz BANDWIDTH

15.4.1. TEST CHANNEL

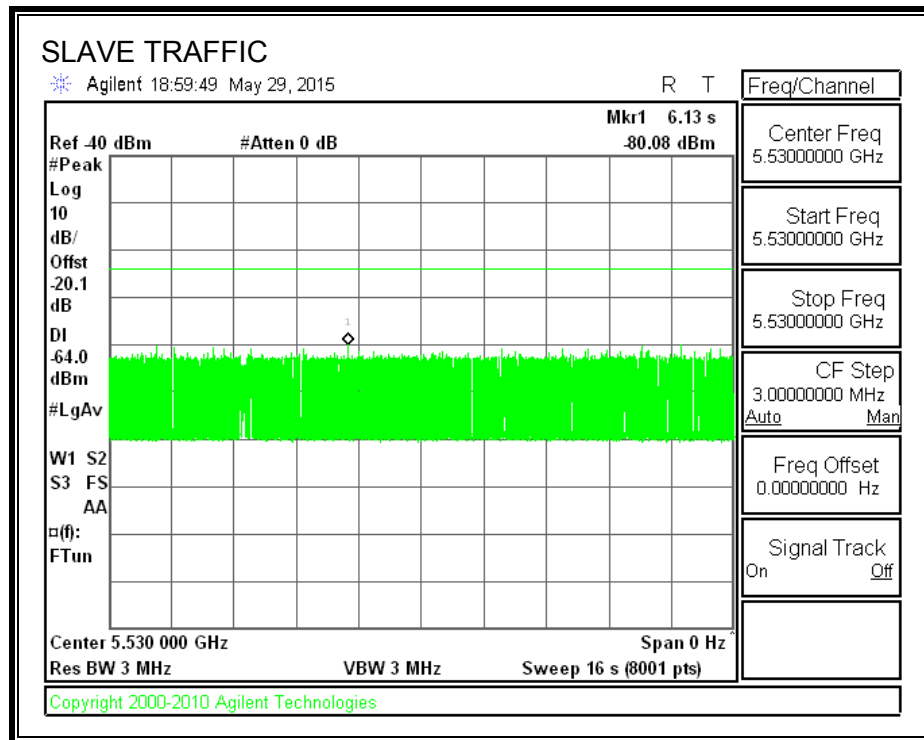
All tests were performed at a channel center frequency of 5530 MHz.

15.4.2. RADAR WAVEFORM AND TRAFFIC

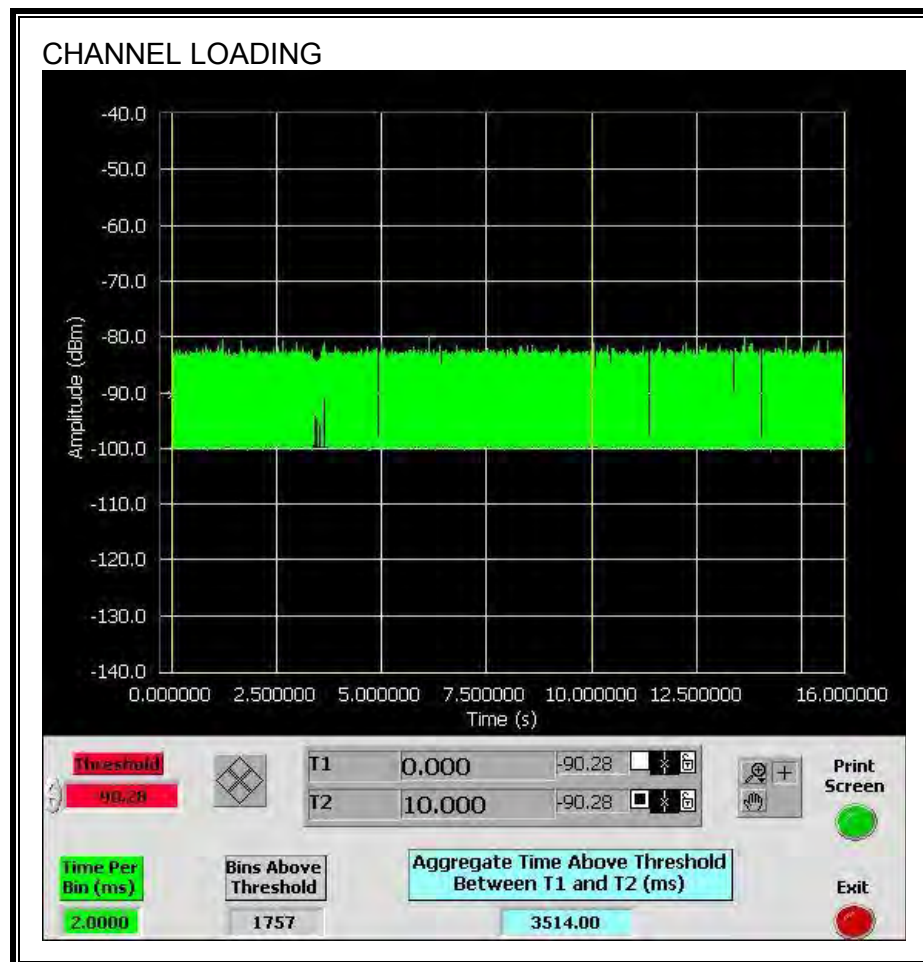
RADAR WAVEFORM



TRAFFIC



CHANNEL LOADING



The level of traffic loading on the channel by the EUT is 35.14%

15.4.3. OVERLAPPING CHANNEL TESTS

RESULTS

These tests are not applicable.

15.4.4. MOVE AND CLOSING TIME

REPORTING NOTES

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

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

The aggregate channel closing transmission time is calculated as follows:

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

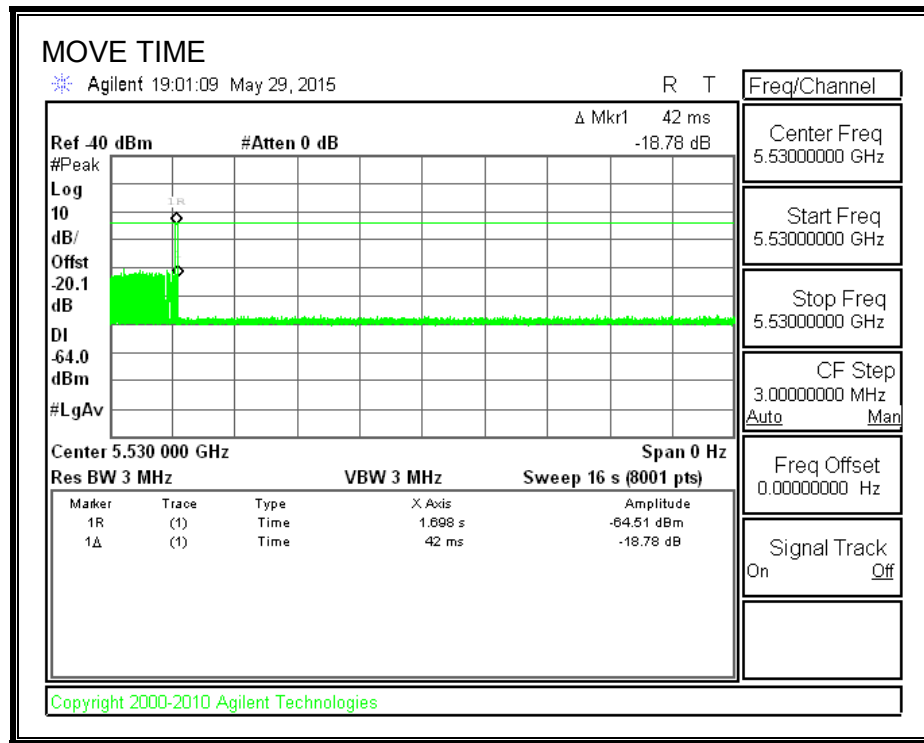
The observation period over which the aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

RESULTS

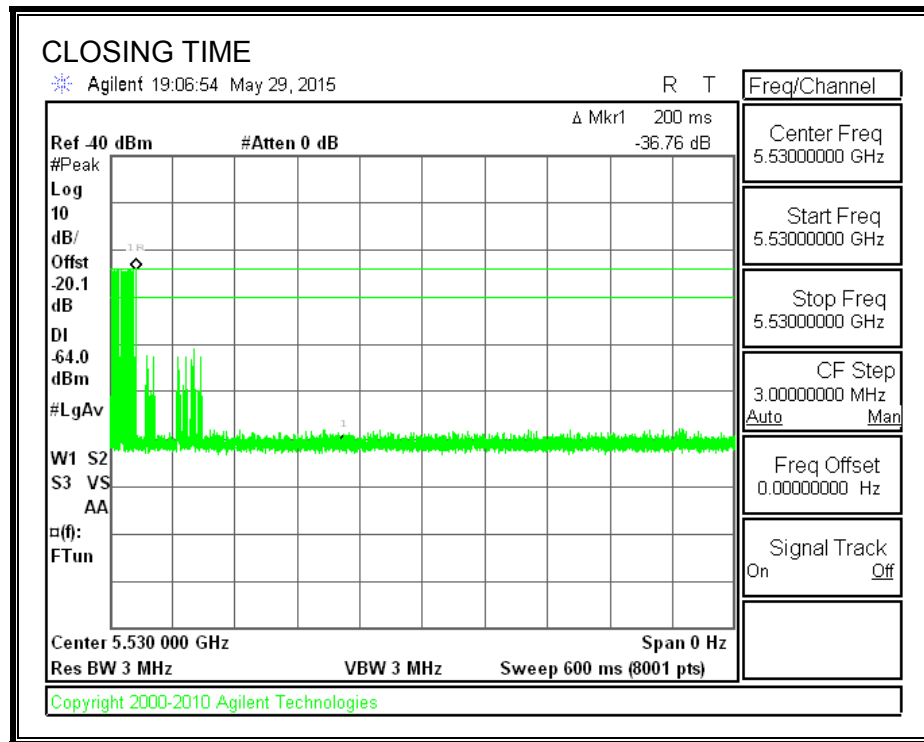
Channel Move Time (sec)	Limit (sec)
0.042	10

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

MOVE TIME

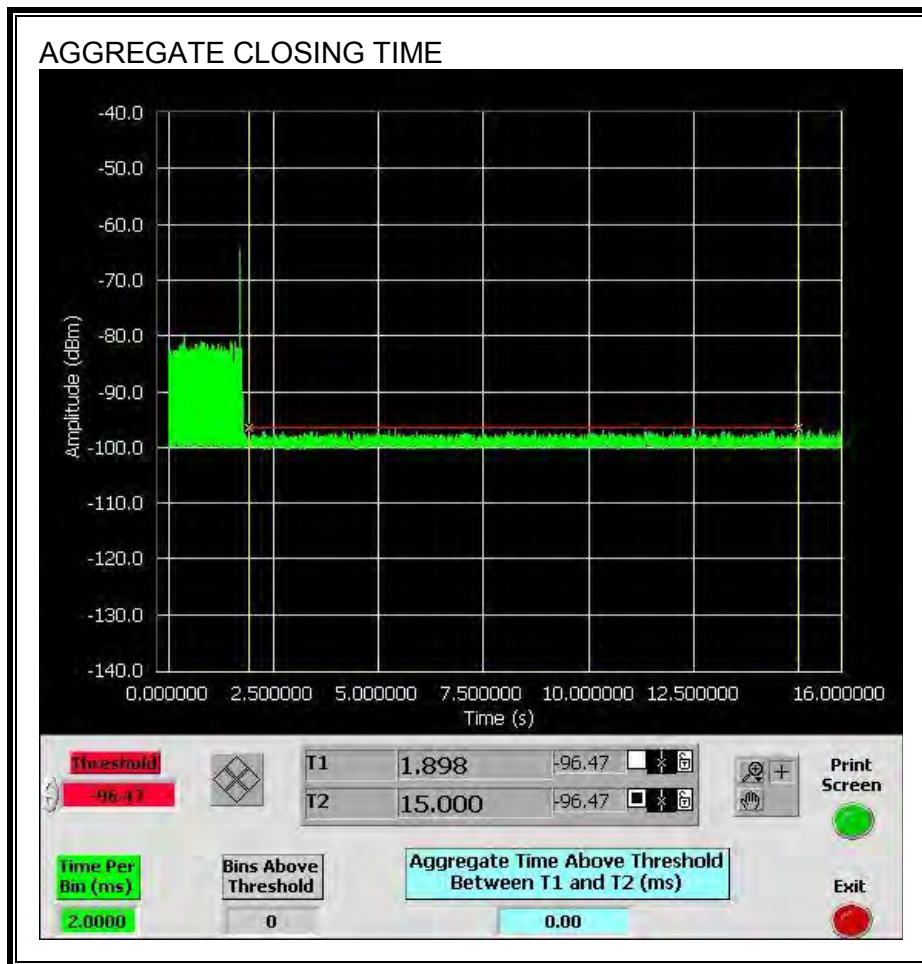


CHANNEL CLOSING TIME



AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

No transmissions are observed during the aggregate monitoring period.



15.4.5. 10-MINUTE BEACON MONITORING PERIOD

RESULTS

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

