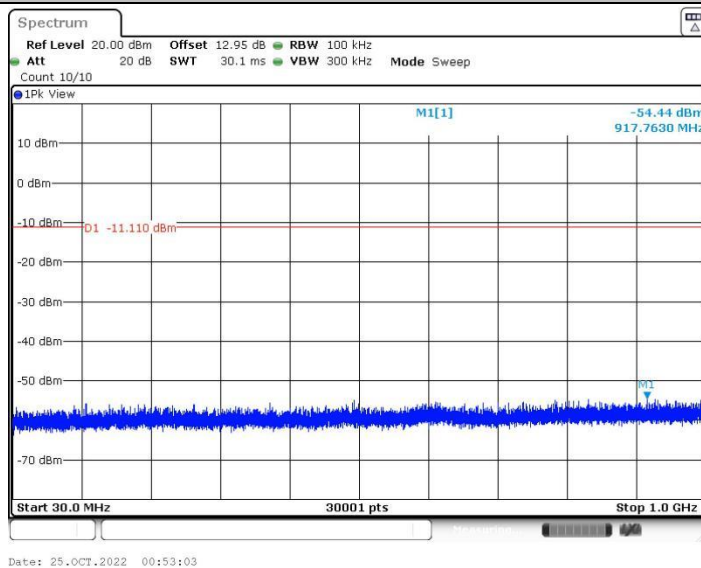
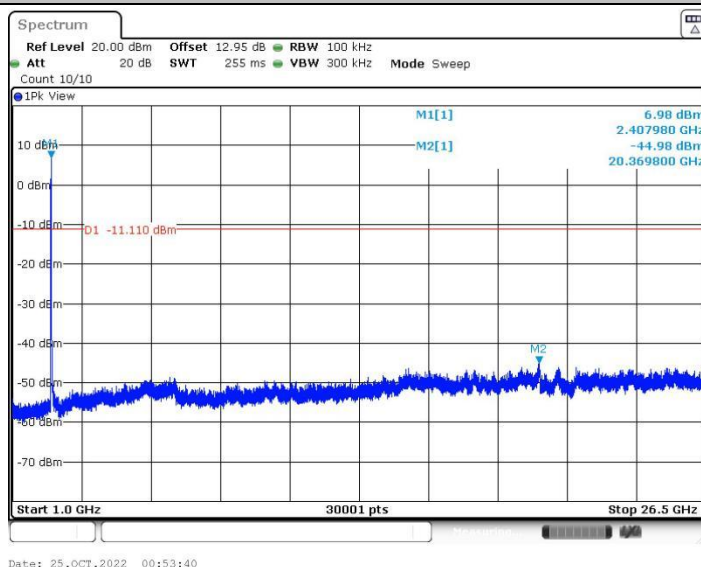




11N20SISO_Ant1_2412_30~1000

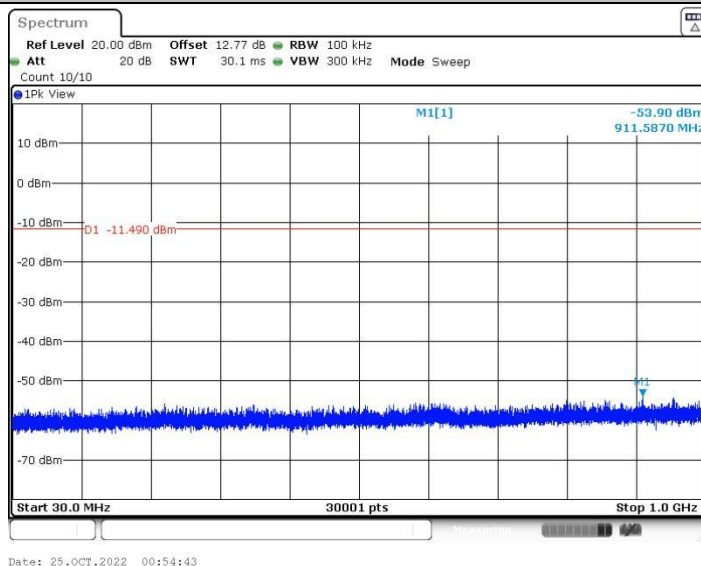


11N20SISO_Ant1_2412_1000~26500

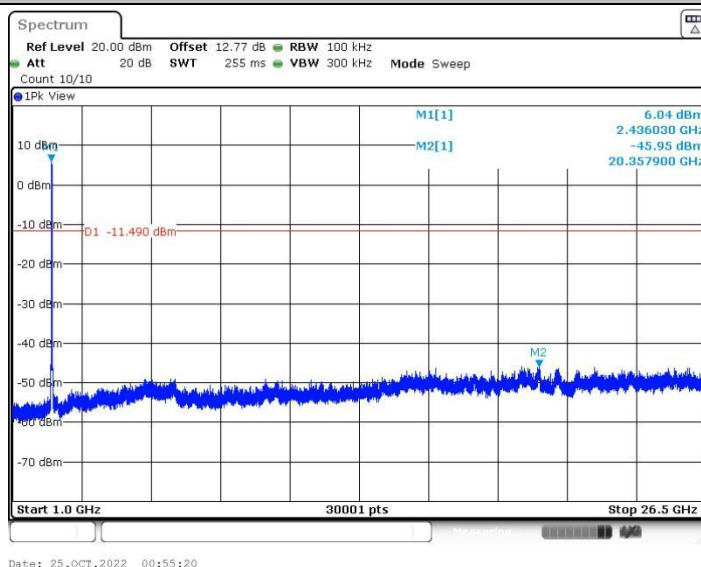




11N20SISO_Ant1_2437_30~1000

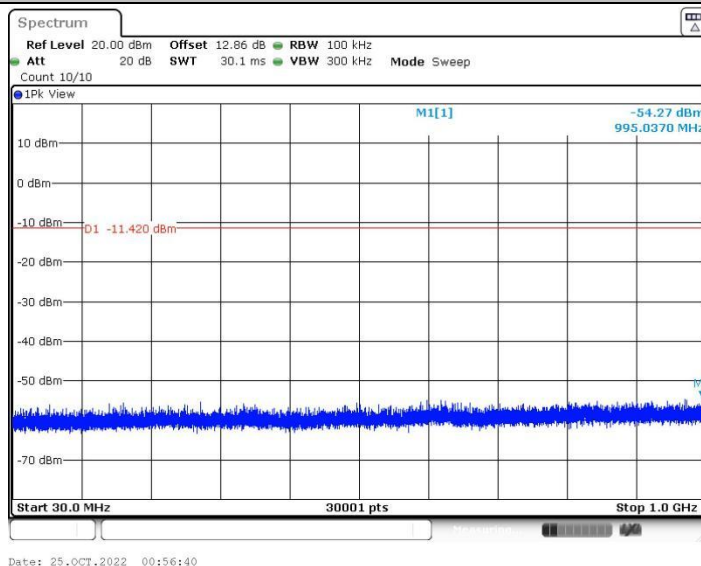


11N20SISO_Ant1_2437_1000~26500

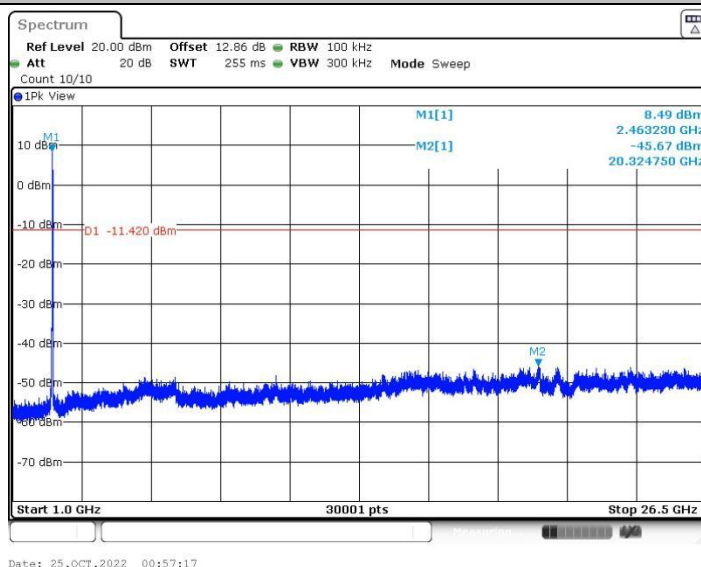




11N20SISO_Ant1_2462_30~1000

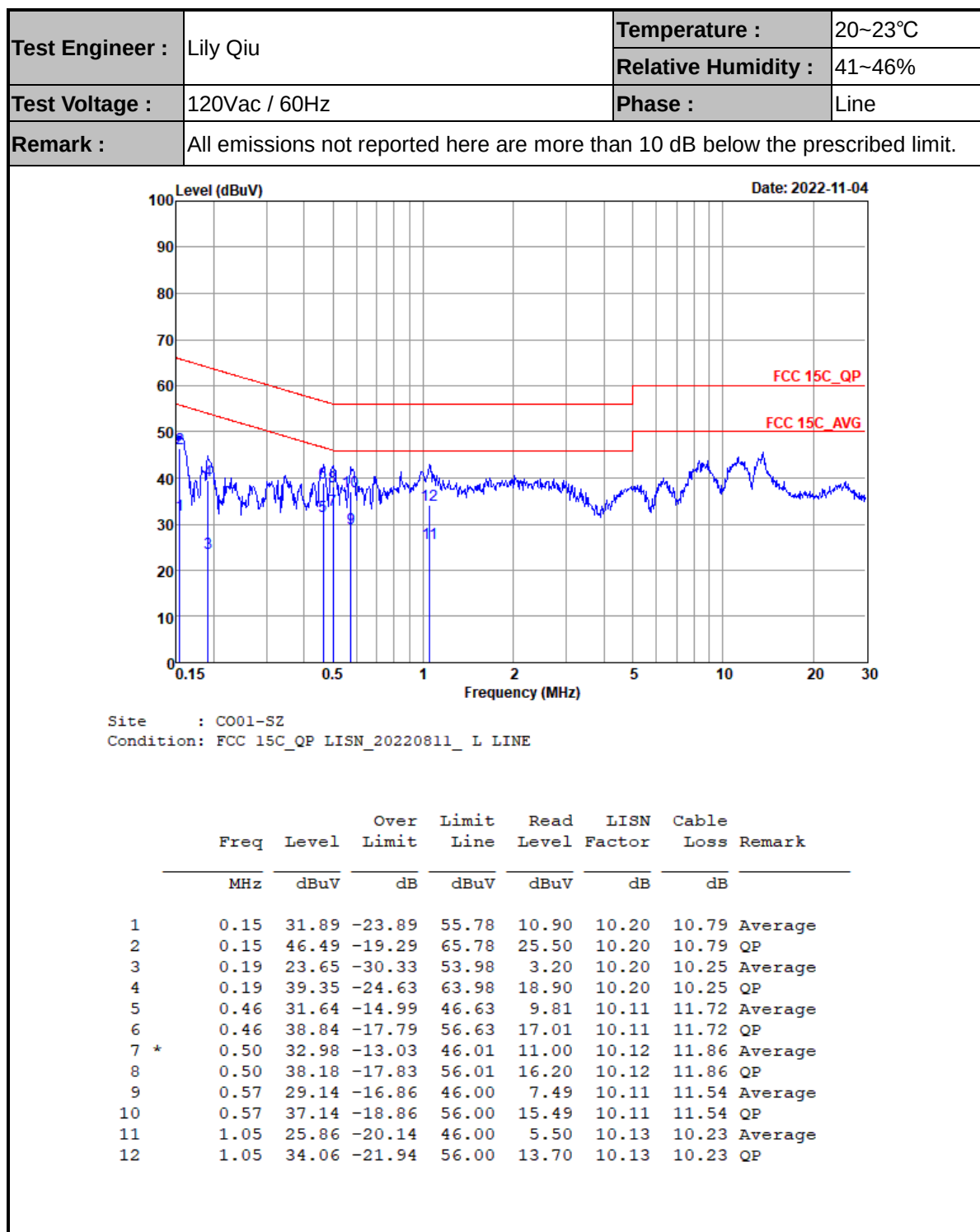


11N20SISO_Ant1_2462_1000~26500



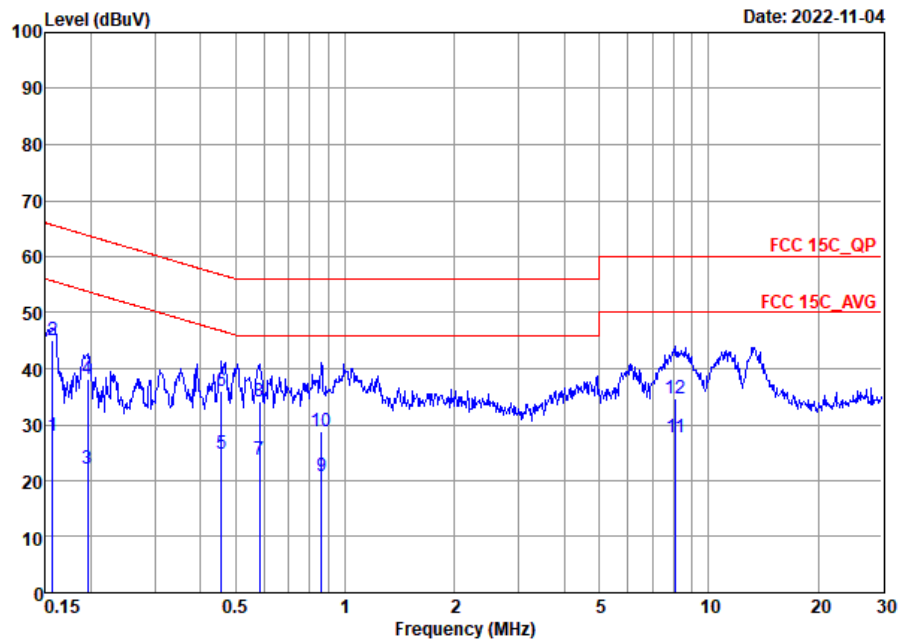


Appendix B. AC Conducted Emission Test Results





Test Engineer :	Lily Qiu	Temperature :	20~23°C
		Relative Humidity :	41~46%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : C001-SZ
Condition: FCC 15C_QP LISN_20220811_ N NEUTRAL

	Freq	Level	Over	Limit	Read	LISN	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
			dB	dBuV	dBuV	dB	dB	
1	0.16	27.96	-27.69	55.65	6.90	10.31	10.75	Average
2 *	0.16	44.96	-20.69	65.65	23.90	10.31	10.75	QP
3	0.20	22.19	-31.61	53.80	1.70	10.28	10.21	Average
4	0.20	38.19	-25.61	63.80	17.70	10.28	10.21	QP
5	0.46	24.78	-21.98	46.76	2.90	10.19	11.69	Average
6	0.46	35.88	-20.88	56.76	14.00	10.19	11.69	QP
7	0.58	23.63	-22.37	46.00	1.90	10.23	11.50	Average
8	0.58	34.23	-21.77	56.00	12.50	10.23	11.50	QP
9	0.86	20.84	-25.16	46.00	0.10	10.15	10.59	Average
10	0.86	28.84	-27.16	56.00	8.10	10.15	10.59	QP
11	8.11	27.69	-22.31	50.00	7.40	10.01	10.28	Average
12	8.11	34.59	-25.41	60.00	14.30	10.01	10.28	QP

Note:

- Level(dBμV) = Read Level(dBμV) + LISN Factor(dB) + Cable Loss(dB)
- Over Limit(dB) = Level(dBμV) – Limit Line(dBμV)



Appendix C. Radiated Spurious Emission

Test Engineer :	Huiliang Zhao	Temperature :	24~25°C
		Relative Humidity :	48~49%

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Margin	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
					Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		2387.385	47.54	-26.46	74	40.42	32.25	7.57	32.7	325	234	P	H
		2385.495	39.21	-14.79	54	32.09	32.25	7.57	32.7	325	234	A	H
		2412	99.98	-	-	92.76	32.31	7.61	32.7	325	234	P	H
		2412	98.15	-	-	90.93	32.31	7.61	32.7	325	234	A	H
		2383.71	48.5	-25.5	74	41.39	32.24	7.57	32.7	322	263	P	V
		2387.07	39.78	-14.22	54	32.66	32.25	7.57	32.7	322	263	A	V
		2412	102.12	-	-	94.9	32.31	7.61	32.7	322	263	P	V
		2412	100.42	-	-	93.2	32.31	7.61	32.7	322	263	A	V
802.11b CH 06 2437MHz		2345.42	46.04	-27.96	74	39.06	32.16	7.52	32.7	400	222	P	H
		2388.12	34.93	-19.07	54	27.81	32.25	7.57	32.7	400	222	A	H
		2437	100.6	-	-	93.3	32.36	7.64	32.7	400	222	P	H
		2437	98.89	-	-	91.59	32.36	7.64	32.7	400	222	A	H
		2487.47	46.02	-27.98	74	38.55	32.47	7.7	32.7	400	222	P	H
		2484.74	35.24	-18.76	54	27.77	32.47	7.7	32.7	400	222	A	H
		2351.44	46.51	-27.49	74	39.51	32.17	7.53	32.7	224	260	P	V
		2388.82	36.24	-17.76	54	29.1	32.26	7.58	32.7	224	260	A	V
		2437	103.44	-	-	96.14	32.36	7.64	32.7	224	260	P	V
		2437	101.69	-	-	94.39	32.36	7.64	32.7	224	260	A	V
		2485.23	46.38	-27.62	74	38.91	32.47	7.7	32.7	224	260	P	V
		2484.81	35.88	-18.12	54	28.41	32.47	7.7	32.7	224	260	A	V
802.11b CH 11 2462MHz		2462	99.37	-	-	91.98	32.42	7.67	32.7	349	219	P	H
		2462	97.45	-	-	90.06	32.42	7.67	32.7	349	219	A	H
		2496.72	46.55	-27.45	74	39.04	32.49	7.72	32.7	349	219	P	H
		2483.52	37.94	-16.06	54	30.48	32.46	7.7	32.7	349	219	A	H
		2462	102.37	-	-	94.98	32.42	7.67	32.7	218	261	P	V
		2462	100.48	-	-	93.09	32.42	7.67	32.7	218	261	A	V
		2483.56	48.55	-25.45	74	41.09	32.46	7.7	32.7	218	261	P	V
		2483.52	40.65	-13.35	54	33.19	32.46	7.7	32.7	218	261	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz

WIFI 802.11b (Harmonic @ 3m)

WIFI	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11b CH 01 2412MHz		4824	51.24	-22.76	74	57.63	34.83	10.92	52.14	340	15	P	H
		4824	44.67	-9.33	54	51.06	34.83	10.92	52.14	340	15	A	H
		4824	51.94	-22.06	74	58.33	34.83	10.92	52.14	235	84	P	V
		4824	47.7	-6.3	54	54.09	34.83	10.92	52.14	235	84	A	V
802.11b CH 06 2437MHz		4874	51.77	-22.23	74	58.02	34.85	11	52.1	238	297	P	H
		4874	47.4	-6.6	54	53.65	34.85	11	52.1	238	297	A	H
		7311	46.72	-27.28	74	48.8	36.32	13.39	51.79	238	297	P	H
		4874	50.89	-23.11	74	57.14	34.85	11	52.1	225	354	P	V
		4874	47.08	-6.92	54	53.33	34.85	11	52.1	225	354	A	V
		7311	47.69	-26.31	74	49.77	36.32	13.39	51.79	225	354	P	V
802.11b CH 11 2462MHz		4924	50.72	-23.28	74	56.83	34.87	11.08	52.06	248	296	P	H
		4924	46.46	-7.54	54	52.57	34.87	11.08	52.06	248	296	A	H
		7386	48.19	-25.81	74	50.35	36.35	13.19	51.7	248	296	P	H
		4924	49.82	-24.18	74	55.93	34.87	11.08	52.06	100	58	P	V
		4924	44.81	-9.19	54	50.92	34.87	11.08	52.06	100	58	A	V
		7386	46.76	-27.24	74	48.92	36.35	13.19	51.7	100	58	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz
WIFI 802.11g (Band Edge @ 3m)

WIFI	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 01 2412MHz		2389.8	64.3	-9.7	74	57.16	32.26	7.58	32.7	362	227	P	H
		2389.905	50.08	-3.92	54	42.94	32.26	7.58	32.7	362	227	A	H
		2412	102.9	-	-	95.68	32.31	7.61	32.7	362	227	P	H
		2412	94.96	-	-	87.74	32.31	7.61	32.7	362	227	A	H
		2389.905	65.29	-8.71	74	58.15	32.26	7.58	32.7	322	277	P	V
		2389.905	50.58	-3.42	54	43.22	32.26	7.8	32.7	322	277	A	V
		2412	102.44	-	-	95.22	32.31	7.61	32.7	322	277	P	V
		2412	96.04	-	-	88.82	32.31	7.61	32.7	322	277	A	V
802.11g CH 06 2437MHz		2387.56	46.77	-27.23	74	39.65	32.25	7.57	32.7	356	220	P	H
		2388.96	36.57	-17.43	54	29.43	32.26	7.58	32.7	356	220	A	H
		2437	103.66	-	-	96.36	32.36	7.64	32.7	356	220	P	H
		2437	94.94	-	-	87.64	32.36	7.64	32.7	356	220	A	H
		2483.69	48.65	-25.35	74	41.19	32.46	7.7	32.7	356	220	P	H
		2483.62	36.87	-17.13	54	29.41	32.46	7.7	32.7	356	220	A	H
		2386.58	49.8	-24.2	74	42.68	32.25	7.57	32.7	358	313	P	V
		2389.66	37.4	-16.6	54	30.26	32.26	7.58	32.7	358	313	A	V
		2437	103.54	-	-	96.24	32.36	7.64	32.7	358	313	P	V
		2437	96.87	-	-	89.57	32.36	7.64	32.7	358	313	A	V
		2484.81	47.06	-26.94	74	39.59	32.47	7.7	32.7	358	313	P	V
		2483.62	36.74	-17.26	54	29.28	32.46	7.7	32.7	358	313	A	V
802.11g CH 11 2462MHz		2462	100.17	-	-	92.78	32.42	7.67	32.7	348	224	P	H
		2462	93.76	-	-	86.37	32.42	7.67	32.7	348	224	A	H
		2483.68	62.76	-11.24	74	55.3	32.46	7.7	32.7	348	224	P	H
		2483.52	47.51	-6.49	54	40.05	32.46	7.7	32.7	348	224	A	H
		2462	103.1	-	-	95.71	32.42	7.67	32.7	215	291	P	V
		2462	96.14	-	-	88.75	32.42	7.67	32.7	215	291	A	V
		2483.72	66.69	-7.31	74	59.23	32.46	7.7	32.7	215	291	P	V
		2483.6	50.41	-3.59	54	42.95	32.46	7.7	32.7	215	291	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz

WIFI 802.11g (Harmonic @ 3m)

WIFI	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 01 2412MHz		4824	45.35	-28.65	74	51.74	34.83	10.92	52.14			P	H
		4824	45.15	-28.85	74	51.54	34.83	10.92	52.14			P	V
802.11g CH 06 2437MHz		4874	43.87	-30.13	74	50.12	34.85	11	52.1			P	H
		7311	47.79	-26.21	74	49.87	36.32	13.39	51.79			P	H
		4874	45.2	-28.8	74	51.45	34.85	11	52.1			P	V
		7311	47.79	-26.21	74	49.87	36.32	13.39	51.79			P	V
802.11g CH 11 2462MHz		4924	44.72	-29.28	74	50.83	34.87	11.08	52.06			P	H
		7386	46.8	-27.2	74	48.96	36.35	13.19	51.7			P	H
		4924	44.55	-29.45	74	50.66	34.87	11.08	52.06			P	V
		7386	47.61	-26.39	74	49.77	36.35	13.19	51.7			P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz

WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 01 2412MHz		2389.485	65.97	-8.03	74	58.83	32.26	7.58	32.7	325	223	P	H
		2389.905	50.37	-3.63	54	43.23	32.26	7.58	32.7	325	223	A	H
		2412	100.82	-	-	93.6	32.31	7.61	32.7	325	223	P	H
		2412	93.96	-	-	86.74	32.31	7.61	32.7	325	223	A	H
		2389.59	62.4	-11.6	74	55.26	32.26	7.58	32.7	330	316	P	V
		2389.905	49.46	-4.54	54	42.32	32.26	7.58	32.7	330	316	A	V
		2412	100.83	-	-	93.61	32.31	7.61	32.7	330	316	P	V
		2412	94	-	-	86.78	32.31	7.61	32.7	330	316	A	V
802.11n HT20 CH 06 2437MHz		2387.84	47.06	-26.94	74	39.94	32.25	7.57	32.7	400	302	P	H
		2389.8	36.49	-17.51	54	29.35	32.26	7.58	32.7	400	302	A	H
		2437	103.81	-	-	96.51	32.36	7.64	32.7	400	302	P	H
		2437	96.43	-	-	89.13	32.36	7.64	32.7	400	302	A	H
		2486.7	47.37	-26.63	74	39.9	32.47	7.7	32.7	400	302	P	H
		2483.55	36.69	-17.31	54	29.23	32.46	7.7	32.7	400	302	A	H
		2388.82	54.09	-19.91	74	46.95	32.26	7.58	32.7	193	294	P	V
		2389.24	38.24	-15.76	54	31.1	32.26	7.58	32.7	193	294	A	V
		2437	105.27	-	-	97.97	32.36	7.64	32.7	193	294	P	V
		2437	98.48	-	-	91.18	32.36	7.64	32.7	193	294	A	V
		2484.53	51.38	-22.62	74	43.91	32.47	7.7	32.7	193	294	P	V
		2483.58	38.44	-15.56	54	30.98	32.46	7.7	32.7	193	294	A	V
802.11n HT20 CH 11 2462MHz		2462	100.62	-	-	93.23	32.42	7.67	32.7	248	306	P	H
		2462	92.94	-	-	85.55	32.42	7.67	32.7	248	306	A	H
		2483.56	62.79	-11.21	74	55.33	32.46	7.7	32.7	248	306	P	H
		2483.52	48.26	-5.74	54	40.8	32.46	7.7	32.7	248	306	A	H
		2462	102.59	-	-	95.2	32.42	7.67	32.7	218	295	P	V
		2462	95.46	-	-	88.07	32.42	7.67	32.7	218	295	A	V
		2483.6	68.02	-5.98	74	60.56	32.46	7.7	32.7	218	295	P	V
		2483.56	50.61	-3.39	54	43.15	32.46	7.7	32.7	218	295	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz
WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 01 2412MHz		4824	45.02	-28.98	74	51.41	34.83	10.92	52.14			P	H
		4824	45.85	-28.15	74	52.24	34.83	10.92	52.14			P	V
802.11n HT20 CH 06 2437MHz		4874	45.59	-28.41	74	51.84	34.85	11	52.1			P	H
		7311	48.62	-25.38	74	50.7	36.32	13.39	51.79			P	H
		4874	45.93	-28.07	74	52.18	34.85	11	52.1			P	V
		7311	47.09	-26.91	74	49.17	36.32	13.39	51.79			P	V
802.11n HT20 CH 11 2462MHz		4924	45.88	-28.12	74	51.99	34.87	11.08	52.06			P	H
		7386	47.06	-26.94	74	49.22	36.35	13.19	51.7			P	H
		4924	45.03	-28.97	74	51.14	34.87	11.08	52.06			P	V
		7386	47.12	-26.88	74	49.28	36.35	13.19	51.7			P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



<RSE Co-location>

WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n HT20 CH 11 & LTE B13 Co-colation	*	2462	103.88	-	-	96.32	32.42	7.84	32.7	100	312	P	H
	*	2462	96.37	-	-	88.81	32.42	7.84	32.7	100	312	A	H
		2483.64	68.68	-5.32	74	61.04	32.46	7.88	32.7	100	312	P	H
		2483.52	50.6	-3.4	54	42.96	32.46	7.88	32.7	100	312	A	H
	*	2462	101.38	-	-	93.82	32.42	7.84	32.7	355	281	P	V
	*	2462	94.16	-	-	86.6	32.42	7.84	32.7	355	281	A	V
		2483.6	67.3	-6.7	74	59.66	32.46	7.88	32.7	355	281	P	V
		2483.52	50.48	-3.52	54	42.84	32.46	7.88	32.7	355	281	A	V
Remark		1. No other spurious found. 2. All results are PASS against Peak and Average limit line.											



2.4GHz 2400~2483.5MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 11 & LTE B13 Co-colation		1559.5	43.96	-30.04	74	41.23	29.46	6.39	33.12			P	H
		2339.25	46.47	-27.53	74	39.44	32.15	7.58	32.7			P	H
		3119	44.06	-29.94	74	53.1	34.47	8.76	52.27			P	H
		4924	45.26	-28.74	74	51.32	34.87	11.13	52.06			P	H
		7386	47.77	-26.23	74	49.98	36.35	13.14	51.7			P	H
		1559.5	44.4	-29.6	74	41.67	29.46	6.39	33.12			P	V
		2339.25	45.51	-28.49	74	38.48	32.15	7.58	32.7			P	V
		3119	43.85	-30.15	74	52.89	34.47	8.76	52.27			P	V
		4924	46.77	-27.23	74	52.83	34.87	11.13	52.06			P	V
		7386	47.47	-26.53	74	49.68	36.35	13.14	51.7			P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz

Emission below 1GHz

2.4GHz WIFI 802.11n HT20 (LF)

WIFI	Note	Frequency	Level	Margin	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
2.4GHz 802.11n HT20 LF		47.46	18.54	-21.46	40	32.27	19.62	1.62	34.97			P	H
		151.25	28.1	-15.4	43.5	41.55	18.92	2.33	34.7			P	H
		322.94	24.66	-21.34	46	36.31	19.63	3.32	34.6			P	H
		369.5	28.53	-17.47	46	39.01	20.69	3.39	34.56			P	H
		604.24	25.59	-20.41	46	30.48	26.1	3.6	34.59			P	H
		861.29	28.81	-17.19	46	29.96	28.76	4.39	34.3			P	H
		43.58	26.34	-13.66	40	40.19	19.54	1.55	34.94			P	V
		85.29	27.35	-12.65	40	45.81	14.34	1.95	34.75			P	V
		166.77	33.74	-9.76	43.5	48.04	17.98	2.42	34.7			P	V
		298.69	25.74	-20.26	46	38.04	19.09	3.21	34.6			P	V
		500.45	23.29	-22.71	46	31.05	23.36	3.38	34.5			P	V
		651.77	26.15	-19.85	46	30.7	26.28	3.67	34.5			P	V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												



Note symbol

*	Fundamental Frequency which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.
!	Test result is Margin line.
P/A	Peak or Average
H/V	Horizontal or Vertical



A calculation example for radiated spurious emission is shown as below:

WIFI	Note	Frequency	Level	Margin	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.					Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
0		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
CH 01													
2412MHz		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

1. Path Loss(dB) = Cable loss(dB) + Filter loss(dB) + Attenuator loss(dB)

2. Level(dBμV/m) =

Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

3. Margin (dB) = Level(dBμV/m) – Limit Line(dBμV/m)

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 54.51(dBμV) – 35.86 (dB)

= 55.45 (dBμV/m)

2. Margin (dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 55.45(dBμV/m) – 74(dBμV/m)

= -18.55(dB)

For Average Limit @ 2390MHz:

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 42.6(dBμV) – 35.86 (dB)

= 43.54 (dBμV/m)

2. Margin (dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 43.54(dBμV/m) – 54(dBμV/m)

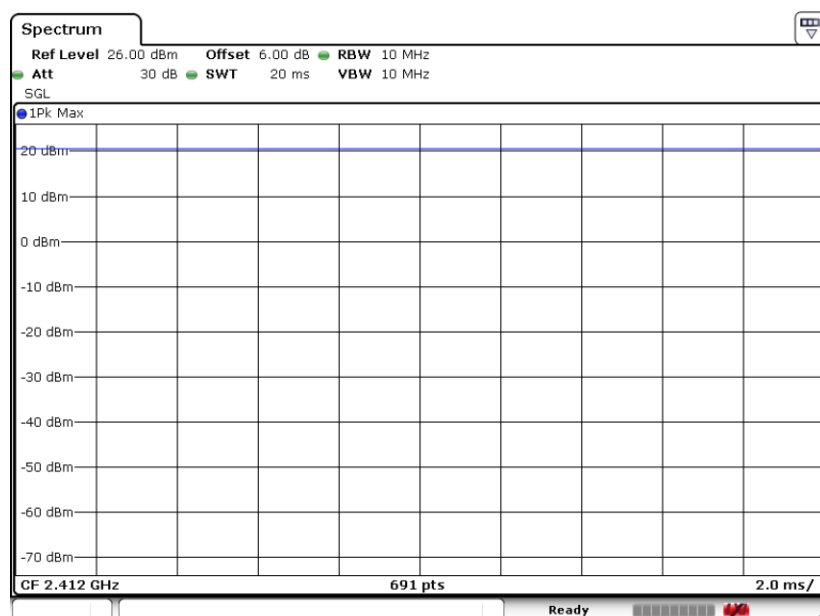
= -10.46(dB)

Both peak and average measured complies with the limit line, so test result is “PASS”.

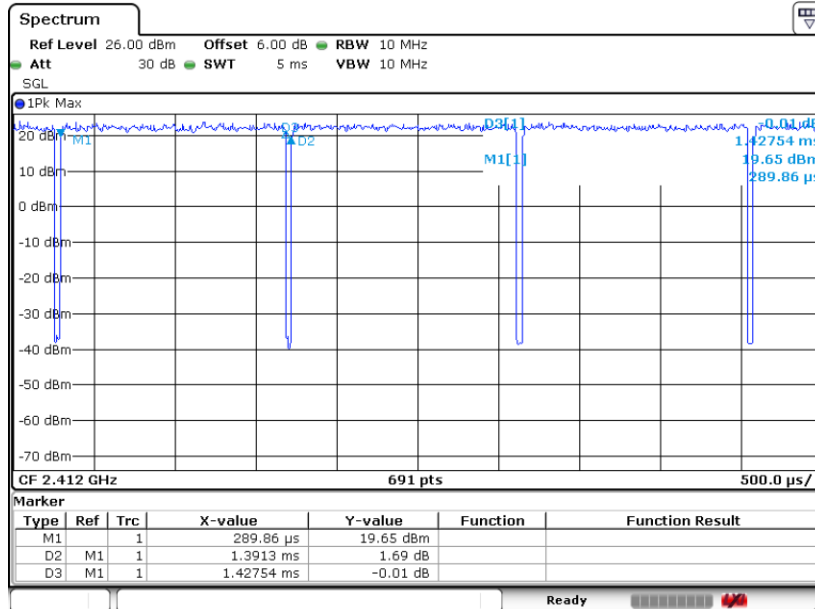
Appendix D. Duty Cycle Plots

Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
802.11b	100	-	-	10Hz
802.11g	97.46	1.391	0.719	1KHz
802.11n HT20	97.28	1.297	0.771	1KHz

802.11b



802.11g



802.11n HT20

