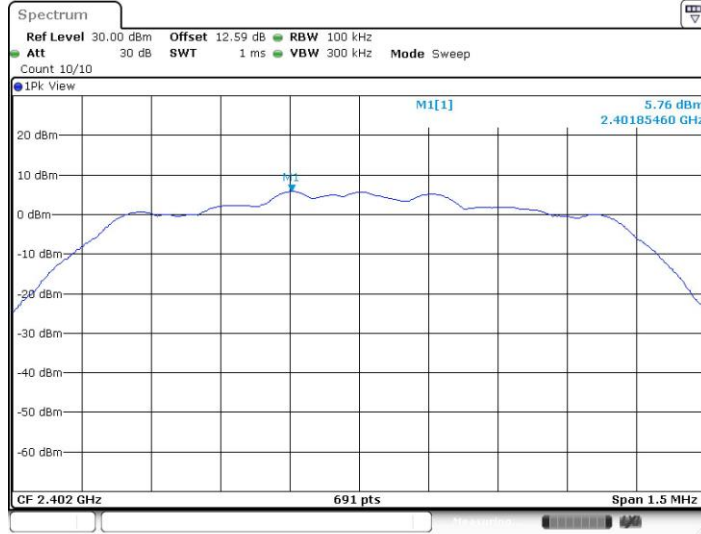


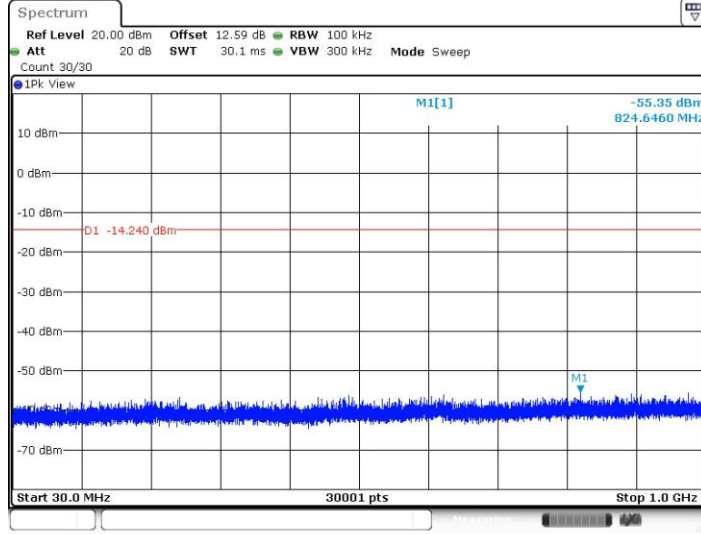


3DH1_Ant1_2402_0~Reference

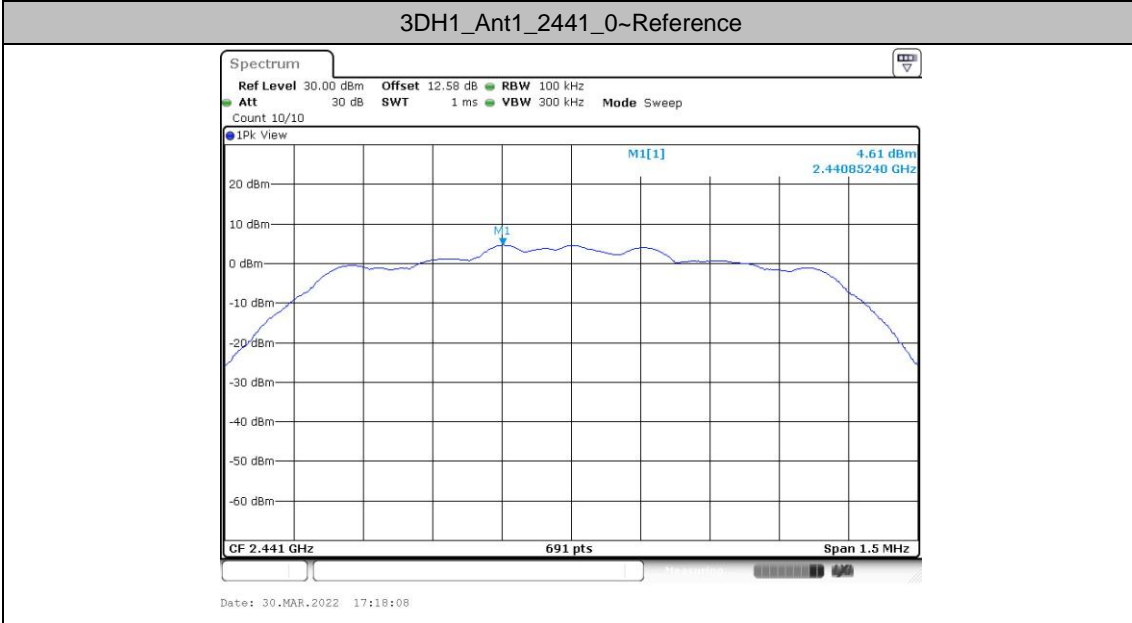
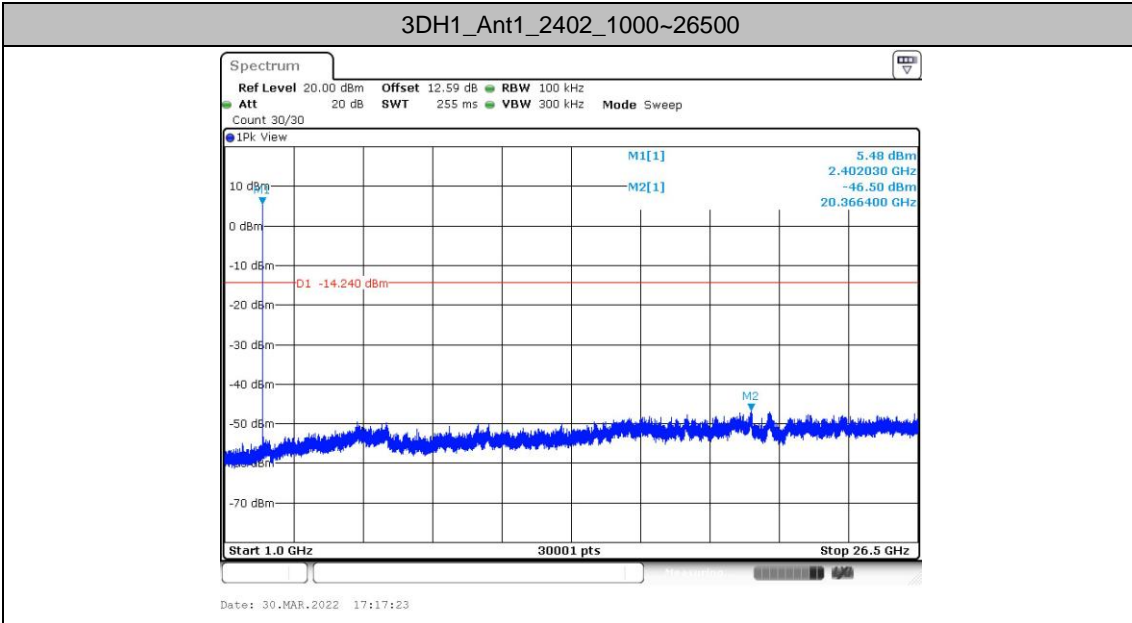


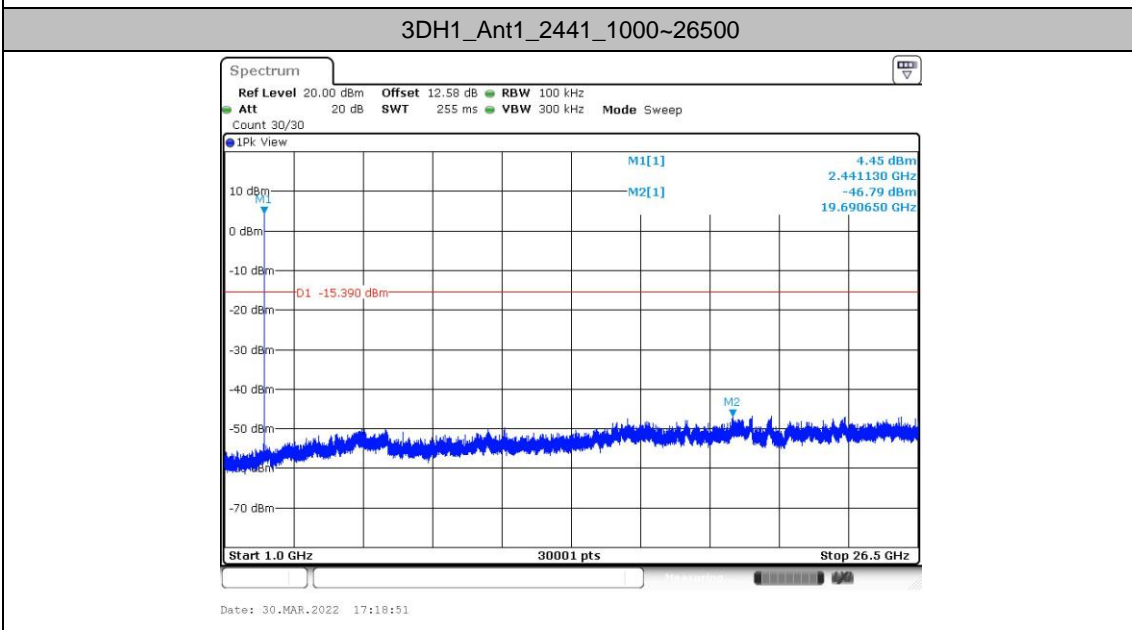
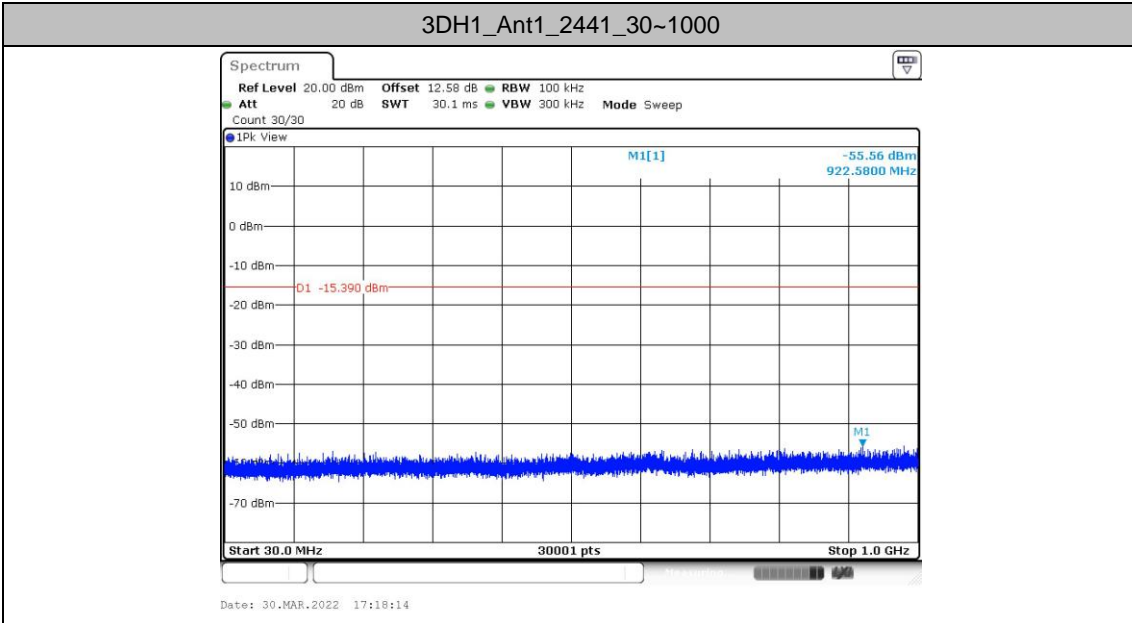
Date: 30.MAR.2022 17:16:40

3DH1_Ant1_2402_30~1000



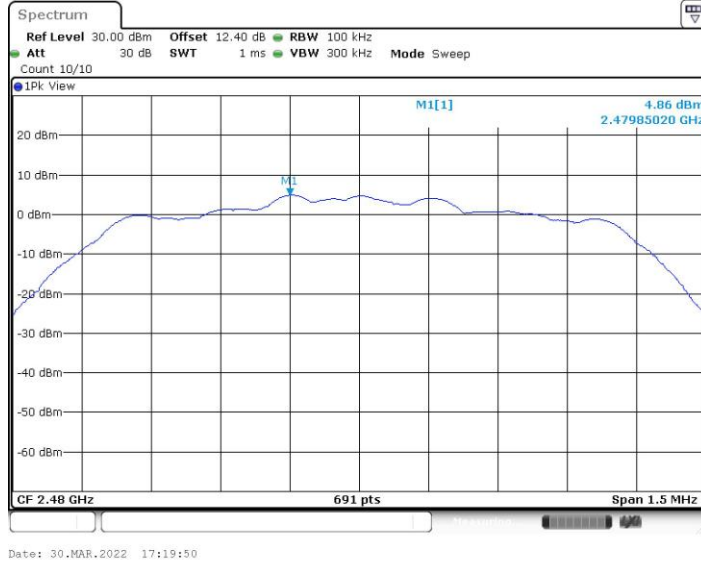
Date: 30.MAR.2022 17:16:46



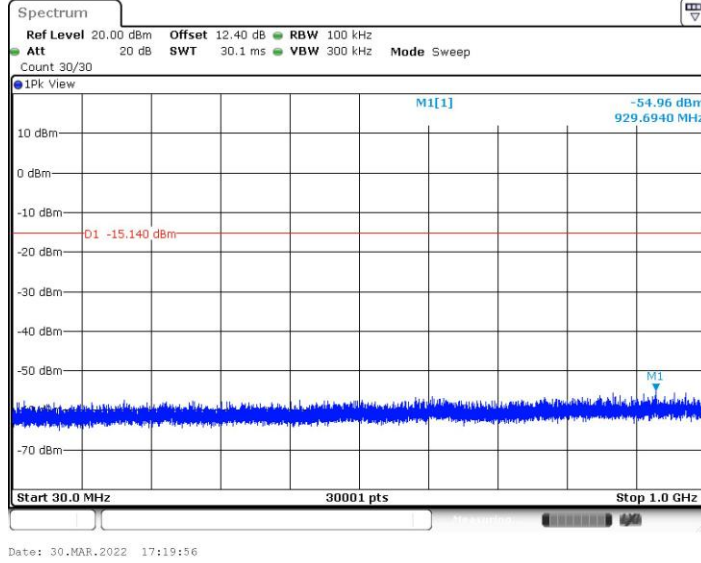


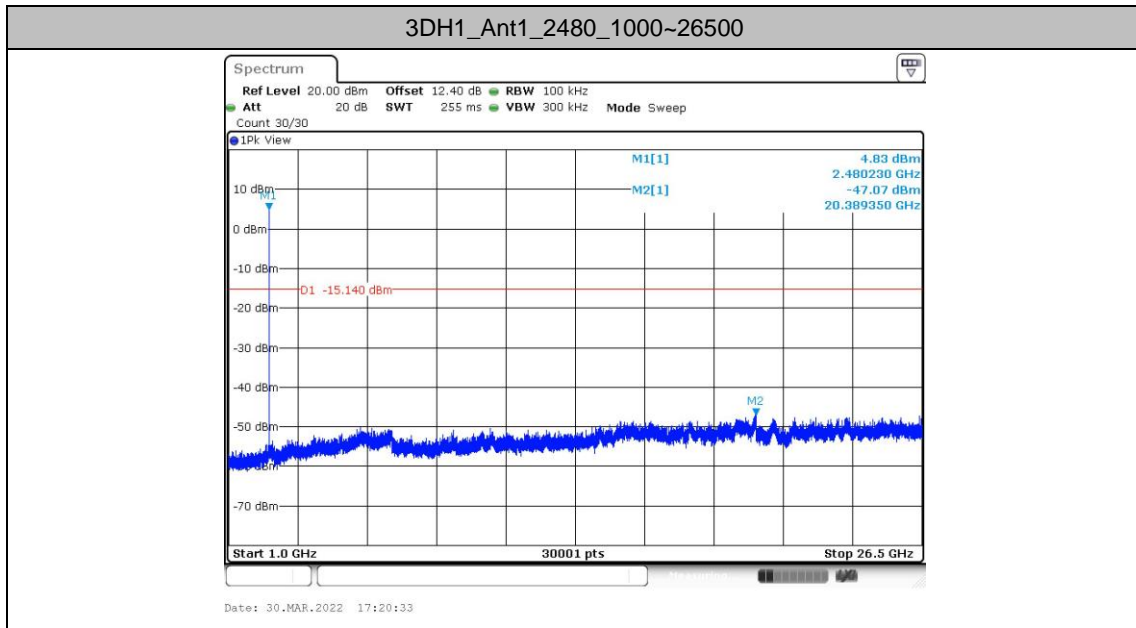


3DH1_Ant1_2480_0~Reference



3DH1_Ant1_2480_30~1000







Dwell Time of each Frequency Measurement

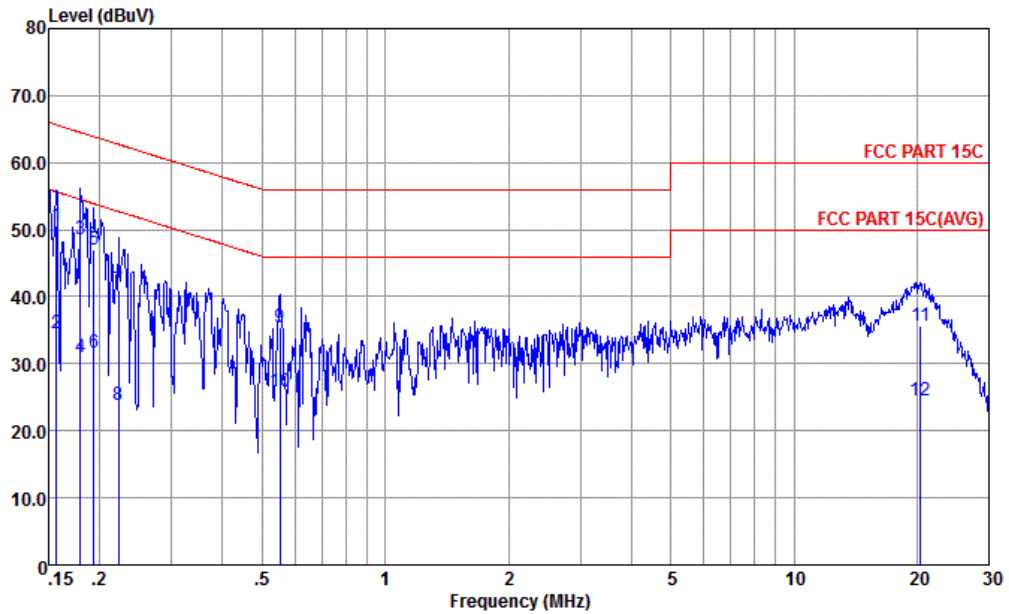
Test Result

Package Mode	Average Hopping Channel	Package Transfer Time (msec)	Dwell Time	Limits	Pass/Fail
			(sec)	(sec)	
Normal	106.67	2.9	0.31	0.4	Pass
AFH	53.34	2.9	0.15	0.4	Pass



Appendix B. AC Conducted Emission Test Results

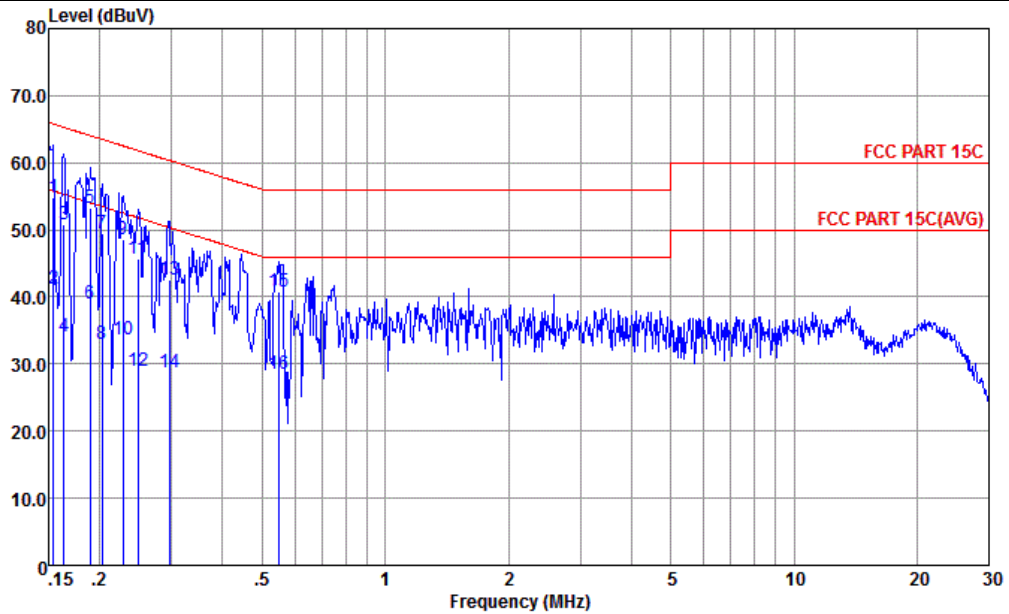
Test Engineer :	Amos Zhang	Temperature :	25.3~26.2°C
		Relative Humidity :	38~40%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
			dB	dBuV	dBuV	dB	dB	
1 *	0.156	50.69	-14.96	65.65	40.21	0.02	10.46	QP
2	0.156	34.59	-21.06	55.65	24.11	0.02	10.46	Average
3	0.180	48.64	-15.86	64.50	38.20	0.03	10.41	QP
4	0.180	31.04	-23.46	54.50	20.60	0.03	10.41	Average
5	0.193	47.02	-16.87	63.89	36.60	0.04	10.38	QP
6	0.193	31.72	-22.17	53.89	21.30	0.04	10.38	Average
7	0.222	40.90	-21.84	62.74	30.50	0.05	10.35	QP
8	0.222	23.90	-28.84	52.74	13.50	0.05	10.35	Average
9	0.552	35.44	-20.56	56.00	25.10	0.10	10.24	QP
10	0.552	25.94	-20.06	46.00	15.60	0.10	10.24	Average
11	20.377	35.60	-24.40	60.00	24.60	0.50	10.50	QP
12	20.377	24.50	-25.50	50.00	13.50	0.50	10.50	Average



Test Engineer :	Amos Zhang	Temperature :	25.3~26.2°C
		Relative Humidity :	38~40%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
			dB	dBuV	dBuV	dB	dB	
1	0.154	54.78	-11.00	65.78	44.20	0.11	10.47	QP
2	0.154	41.18	-14.60	55.78	30.60	0.11	10.47	Average
3	0.163	50.85	-14.45	65.30	40.29	0.11	10.45	QP
4	0.163	34.15	-21.15	55.30	23.59	0.11	10.45	Average
5 *	0.189	53.29	-10.77	64.06	42.81	0.10	10.38	QP
6	0.189	38.99	-15.07	54.06	28.51	0.10	10.38	Average
7	0.203	49.36	-14.13	63.49	38.90	0.10	10.36	QP
8	0.203	33.06	-20.43	53.49	22.60	0.10	10.36	Average
9	0.228	48.65	-13.87	62.52	38.20	0.10	10.35	QP
10	0.228	33.75	-18.77	52.52	23.30	0.10	10.35	Average
11	0.248	45.63	-16.19	61.82	35.20	0.10	10.33	QP
12	0.248	28.93	-22.89	51.82	18.50	0.10	10.33	Average
13	0.296	42.61	-17.76	60.37	32.20	0.10	10.31	QP
14	0.296	28.71	-21.66	50.37	18.30	0.10	10.31	Average
15	0.549	40.85	-15.15	56.00	30.50	0.11	10.24	QP
16	0.549	28.55	-17.45	46.00	18.20	0.11	10.24	Average

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

2.4GHz 2400~2483.5MHz

BT (Band Edge @ 3m)

BT	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable 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)
BT CH00 2402MHz		2386.7	51.05	-22.95	74	47.93	32.88	7.1	36.86	110	126	P	H
		2386.7	26.29	-27.71	54	-	-	-	-	-	-	A	H
	*	2402	103.39	-	-	100.24	32.88	7.13	36.86	110	126	P	H
		2402	78.63	-	-	-	-	-	-	-	-	A	H
		2353.55	50.51	-23.49	74	47.52	32.83	7.04	36.88	356	298	P	V
		2353.55	25.75	-28.25	54	-	-	-	-	-	-	A	V
	*	2402	100.28	-	-	97.13	32.88	7.13	36.86	356	298	P	V
		2402	75.52	-	-	-	-	-	-	-	-	A	V
BT CH 78 2480MHz		2483.62	54.97	-19.03	74	51.56	32.98	7.25	36.82	124	246	P	H
		2483.62	30.21	-23.79	54	-	-	-	-	-	-	A	H
	*	2480	104.39	-	-	100.98	32.98	7.25	36.82	124	246	P	H
		2480	79.63	-	-	-	-	-	-	-	-	A	H
		2494.6	52.09	-21.91	74	48.62	33	7.28	36.81	337	302	P	V
		2494.6	27.33	-26.67	54	-	-	-	-	-	-	A	V
	*	2480	100.67	-	-	97.26	32.98	7.25	36.82	337	302	P	V
		2480	75.91	-	-	-	-	-	-	-	-	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz
BT (Harmonic @ 3m)

Table with 14 columns: BT, 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). Rows include BT CH 00 (2402MHz) and BT CH 39 (2441MHz) and BT CH 78 (2480MHz) with multiple frequency entries.

Remark

- 1. No other spurious found.
2. All results are PASS against Peak and Average limit line.



Emission below 1GHz

2.4GHz BT (LF)

BT	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
2.4GHz BT LF		165.8	27.04	-16.46	43.5	40.85	17.12	1.96	32.89	-	-	P	H
		216.24	30.39	-15.61	46	43.94	17.31	2.24	33.1	-	-	P	H
		263.77	27.76	-18.24	46	38.71	19.62	2.48	33.05	-	-	P	H
		408.3	31.3	-14.7	46	38.14	22.86	3.08	32.78	-	-	P	H
		498.51	35.46	-10.54	46	40.38	24.47	3.41	32.8	-	-	P	H
		900.09	31.59	-14.41	46	32.1	27.4	4.59	32.5	-	-	P	H
		167.74	23.21	-20.29	43.5	37.07	17.08	1.97	32.91	-	-	P	V
		263.77	23.19	-22.81	46	34.14	19.62	2.48	33.05	-	-	P	V
		408.3	25.89	-20.11	46	32.73	22.86	3.08	32.78	-	-	P	V
		498.51	32.17	-13.83	46	37.09	24.47	3.41	32.8	-	-	P	V
		599.39	30.64	-15.36	46	33.89	25.51	3.74	32.5	-	-	P	V
		640.13	32.97	-13.03	46	35.95	25.82	3.86	32.66	-	-	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 over limit 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	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1+2		(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

- Level(dBμV/m) =
Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)
- Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

For Peak Limit @ 2390MHz:

- Level(dBμV/m)
= Antenna Factor(dB/m) + Cable 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)
- Over Limit(dB)
= Level(dBμV/m) – Limit Line(dBμV/m)
= 55.45(dBμV/m) – 74(dBμV/m)
= -18.55(dB)

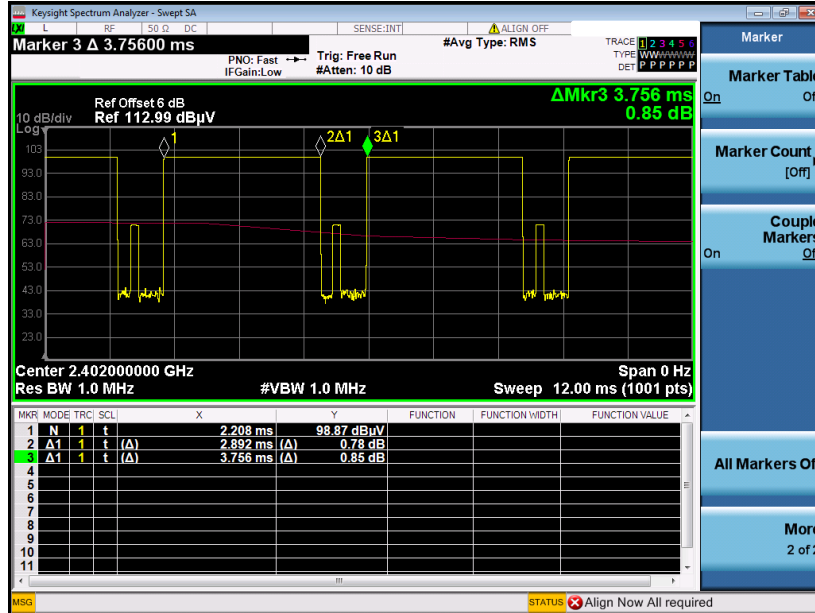
For Average Limit @ 2390MHz:

- Level(dBμV/m)
= Antenna Factor(dB/m) + Cable 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)
- Over Limit(dB)
= Level(dBμV/m) – Limit Line(dBμV/m)
= 43.54(dBμV/m) – 54(dBμV/m)
= -10.46(dB)

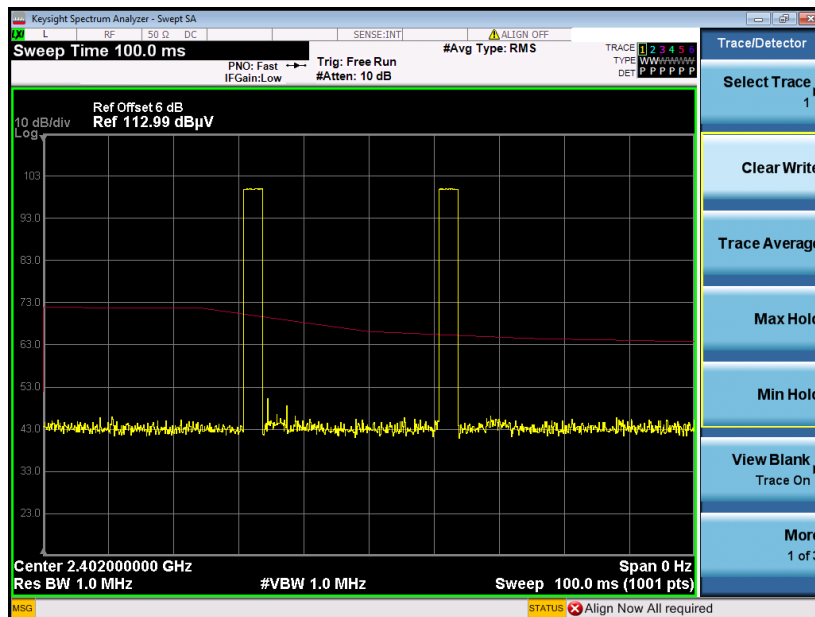
Both peak and average measured complies with the limit line, so test result is “PASS”.

Appendix D. Duty Cycle Plots

3DH5 on time (One Pulse) Plot on Channel 39



3DH5 on time (Count Pulses) Plot on Channel 39



Note:

1. Worst case Duty cycle = on time/100 milliseconds = $2 * 2.89 / 100 = 5.78 \%$
2. Worst case Duty cycle correction factor = $20 * \log(\text{Duty cycle}) = -24.76 \text{ dB}$
3. 3DH5 has the highest duty cycle worst case and is reported.