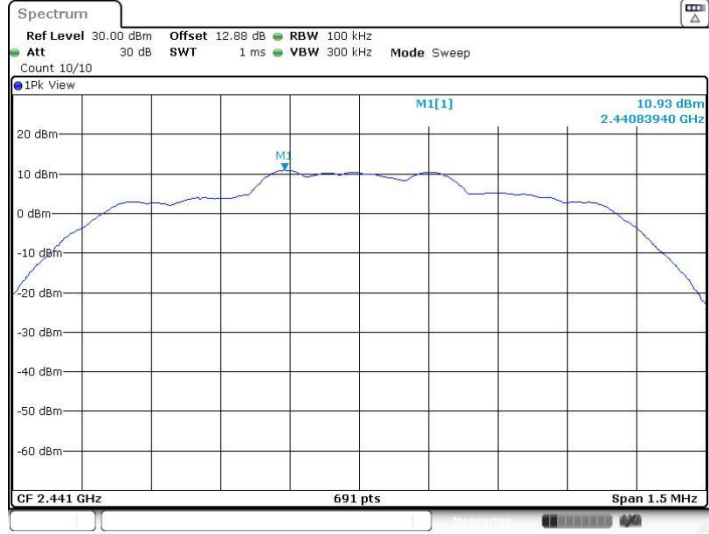


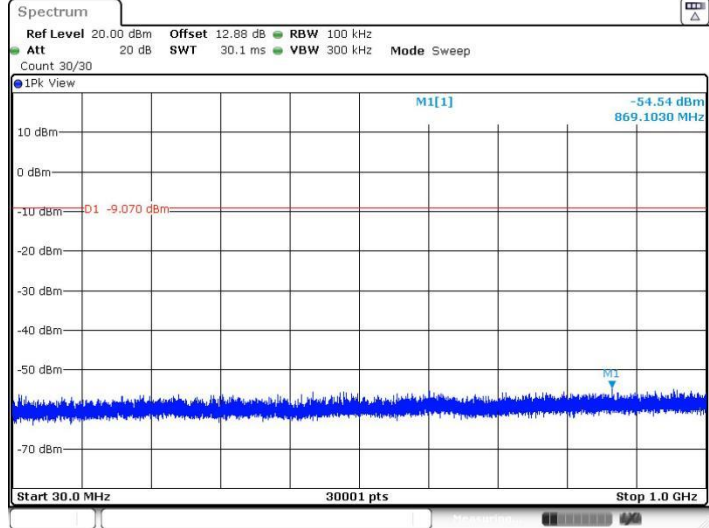


2DH1\_Ant1\_2441\_0~Reference



Date: 5.JUL.2022 12:30:48

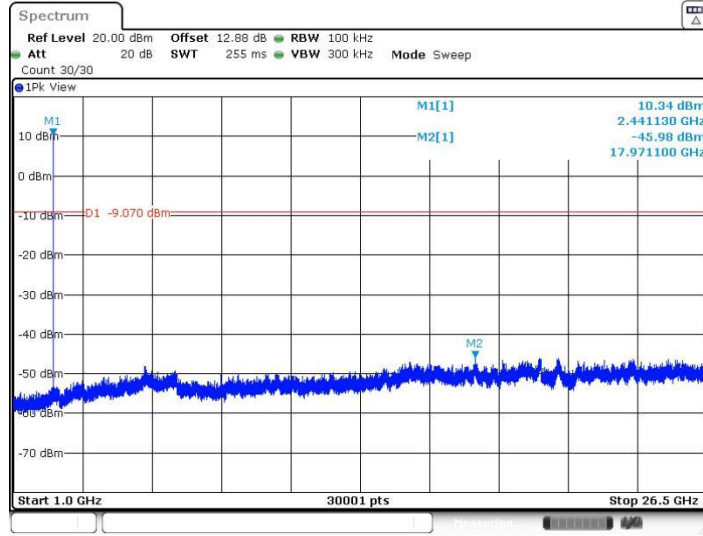
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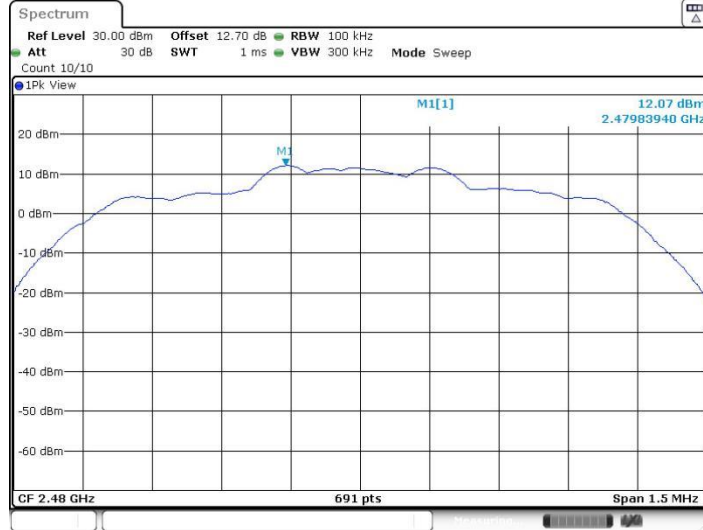


2DH1\_Ant1\_2441\_1000~26500



Date: 5.JUL.2022 12:31:31

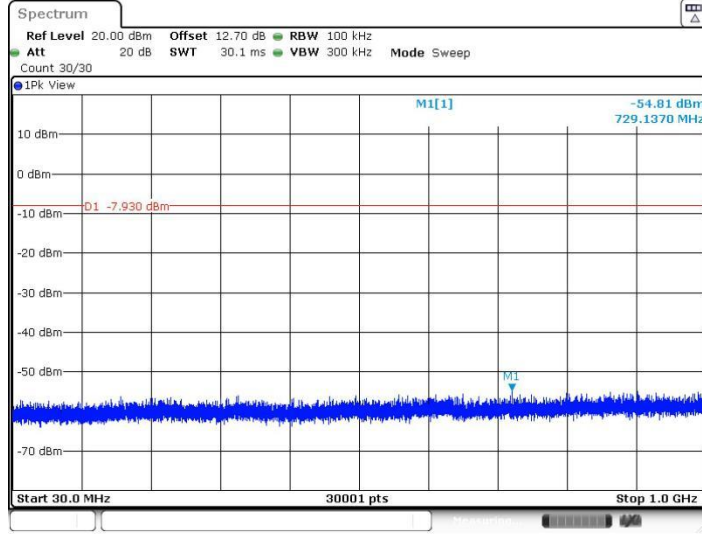
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Date: 5.JUL.2022 12:32:16

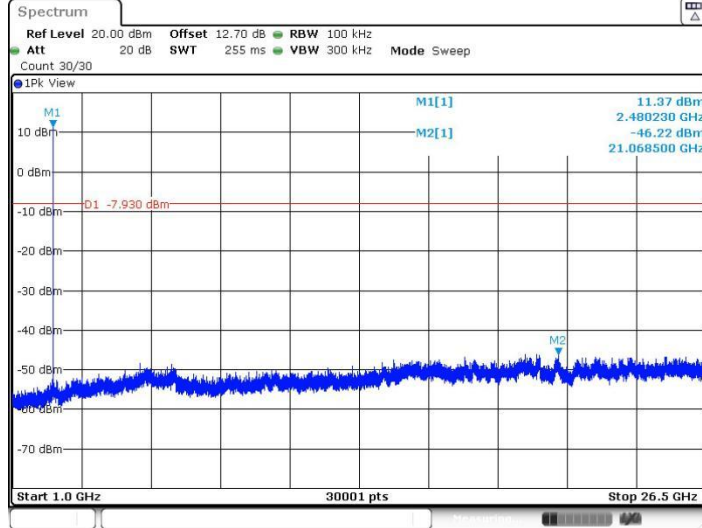


2DH1\_Ant1\_2480\_30~1000

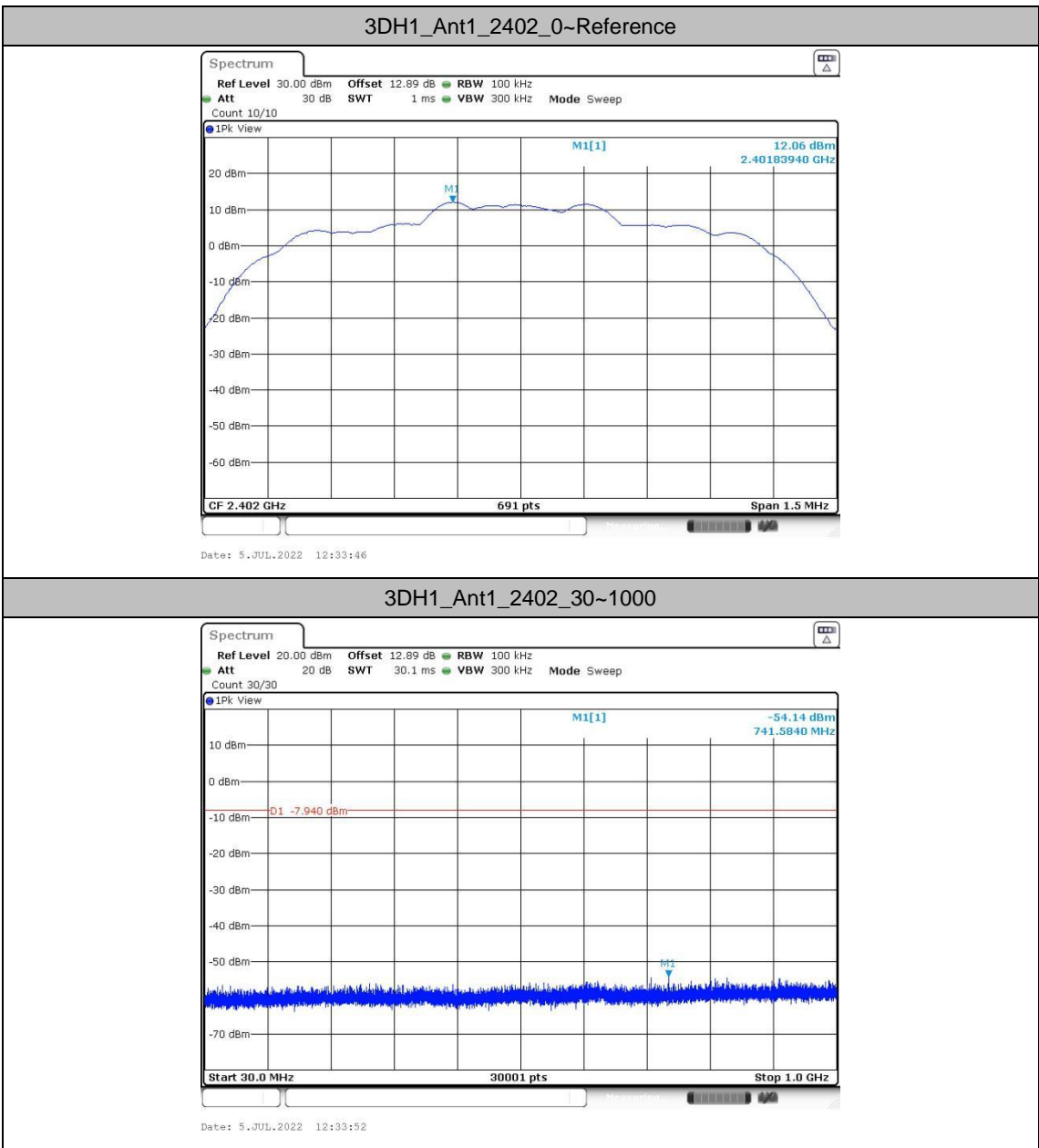


Date: 5.JUL.2022 12:32:23

2DH1\_Ant1\_2480\_1000~26500

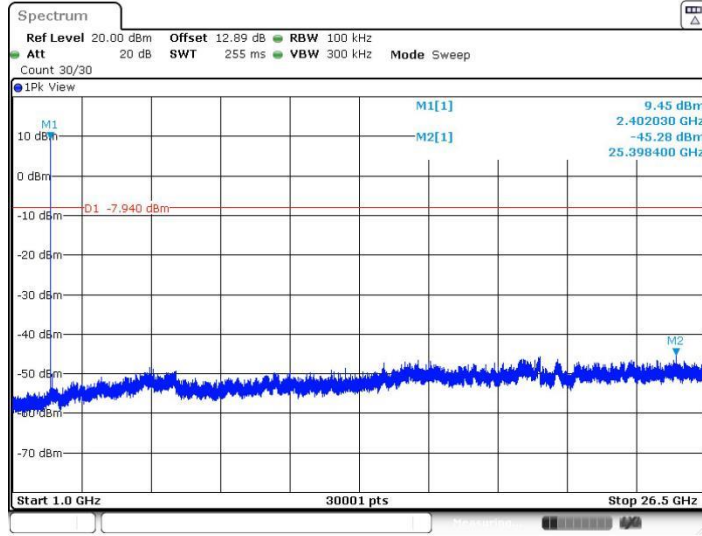


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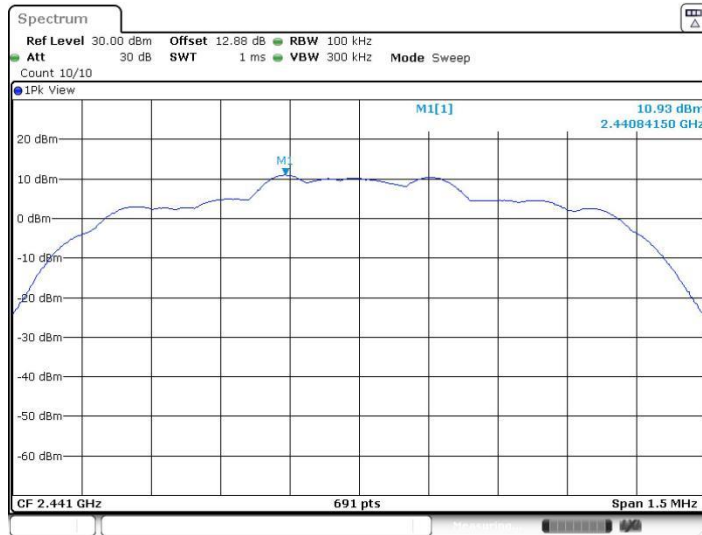




3DH1\_Ant1\_2402\_1000~26500

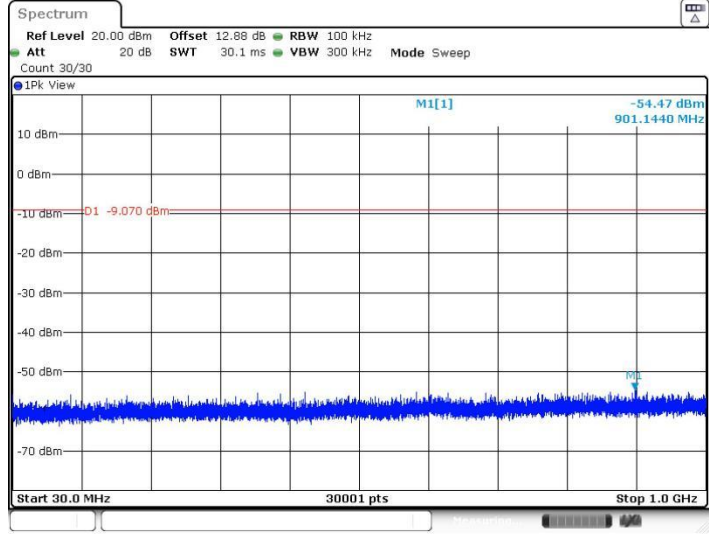


3DH1\_Ant1\_2441\_0~Reference



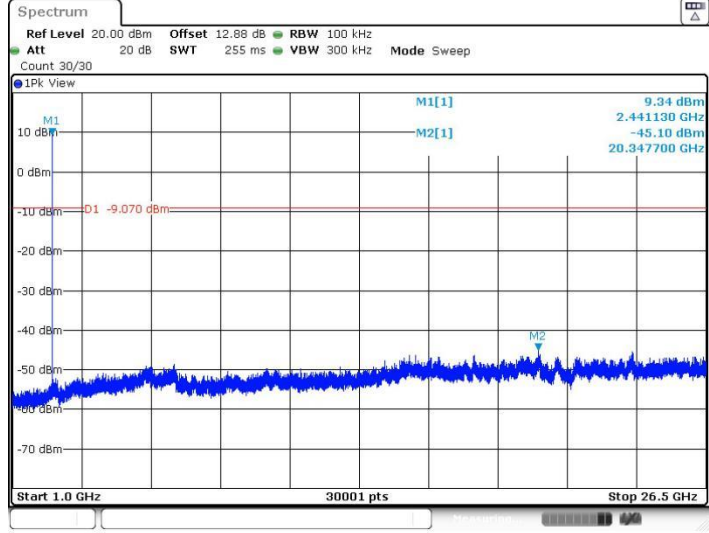


3DH1\_Ant1\_2441\_30~1000



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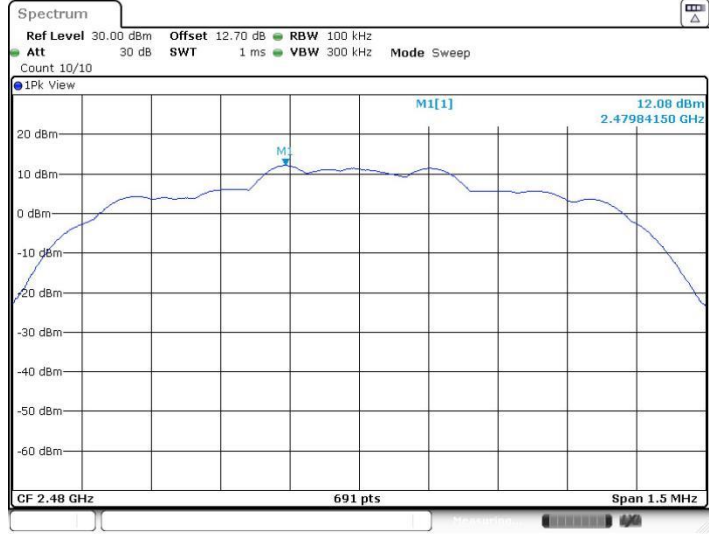
3DH1\_Ant1\_2441\_1000~26500



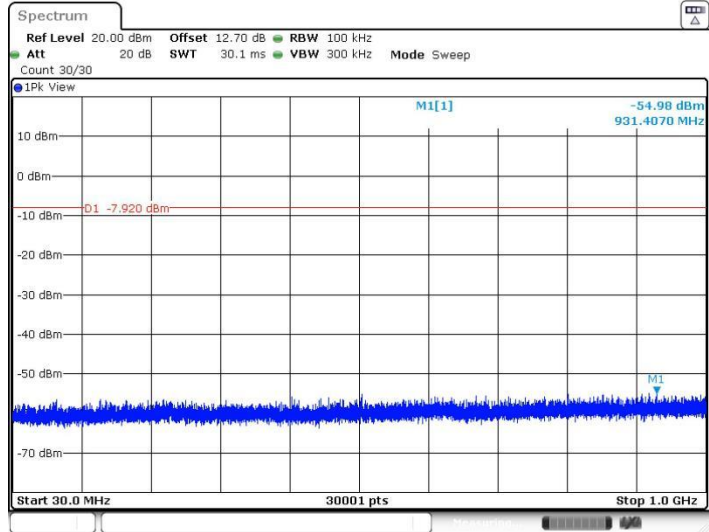
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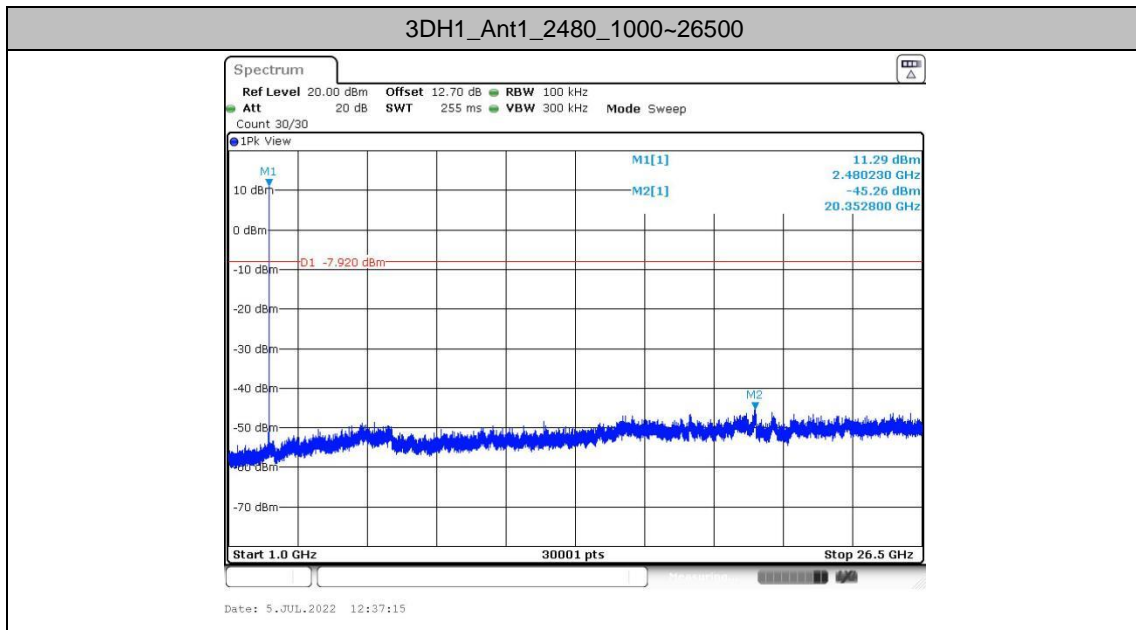


3DH1\_Ant1\_2480\_0~Reference



3DH1\_Ant1\_2480\_30~1000







## Dwell Time

### Test Result

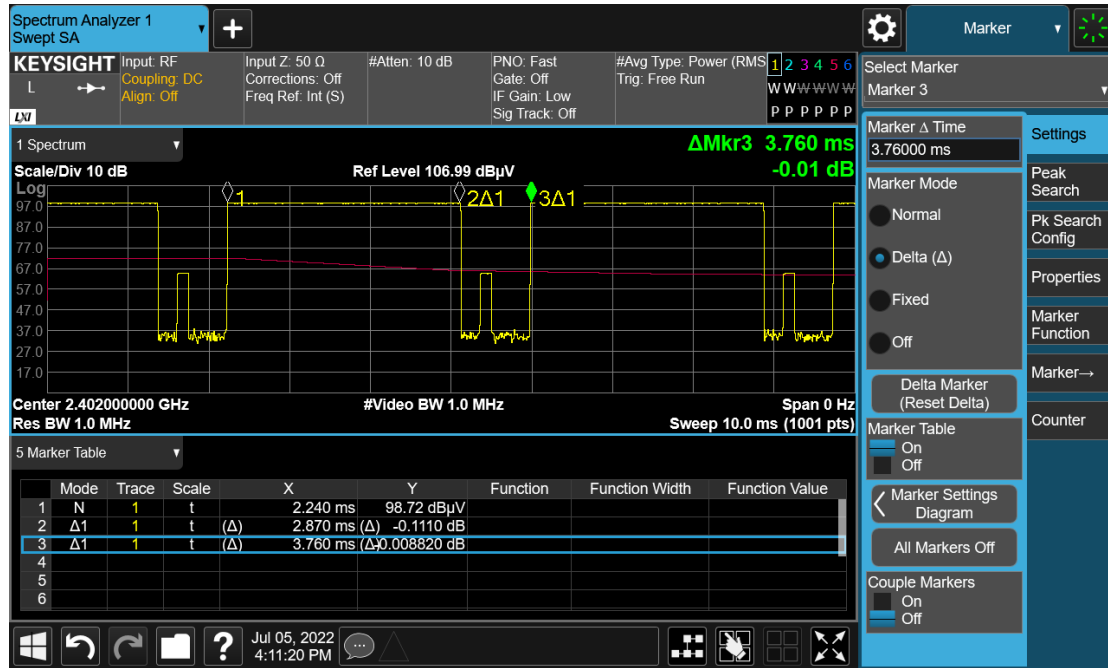
Mod.	Hopping Channel Number Rate	Hops Over Occupancy Time(hops)	Package Transfer Time (msec) (MHz)	Dwell Time (sec)	Limits (sec)	Pass/Fail
Nomal	79	106.67	2.87	0.31	0.4	Pass
AFH	20	53.33	2.87	0.15	0.4	Pass

**Remark:**

1. In normal mode, hopping rate is 1600 hops/s with 6 slots (5 Transmit and 1 Receive slot) in 79 hopping channels.  
With channel hopping rate (1600 / 6 / 79) in Occupancy Time Limit (0.4 x 79) (s), Hops Over Occupancy Time comes to (1600 / 6 / 79) x (0.4 x 79) = 106.67 hops.
2. In AFH mode, hopping rate is 800 hops/s with 6 slots in 20 hopping channels.  
With channel hopping rate (800 / 6 / 20) in Occupancy Time Limit (0.4 x 20) (s), Hops Over Occupancy Time comes to (800 / 6 / 20) x (0.4 x 20) = 53.33 hops.
3. Dwell Time(s) = Hops Over Occupancy Time (hops) x Package Transfer Time.



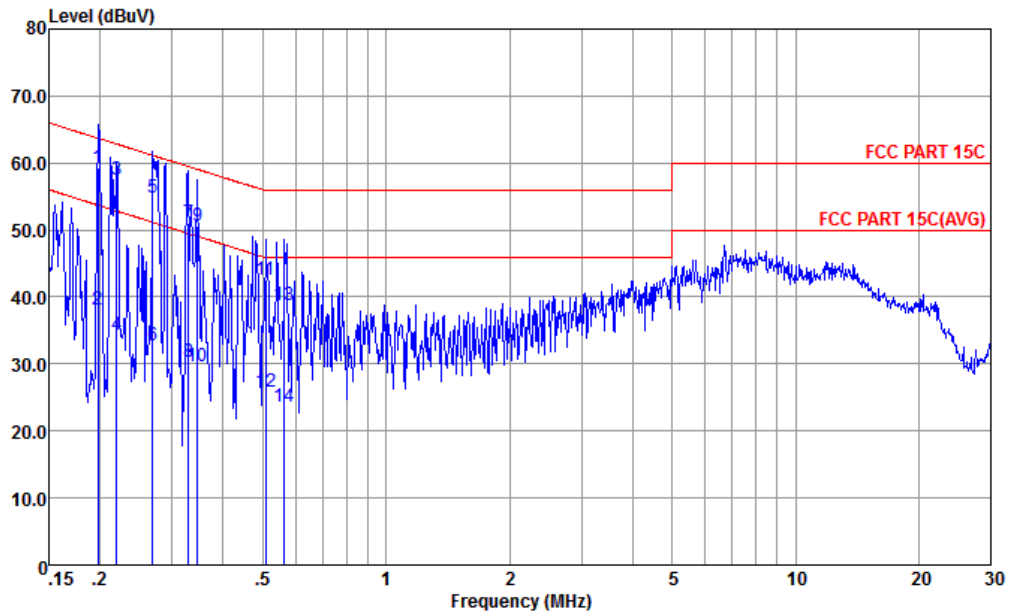
### Test Graphs





## 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.		

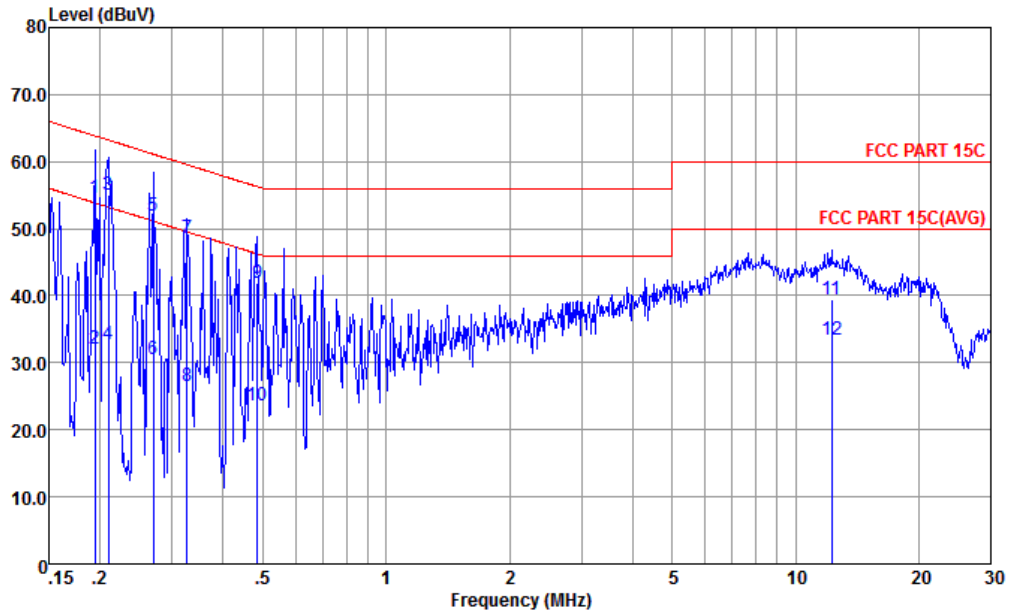


Site : CO01-KS  
 Condition : FCC PART 15C LISN-060105-L LINE

	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
			dB	dBuV	dBuV	dB	dB	
1 *	0.198	59.31	-4.40	63.71	48.90	0.04	10.37	QP
2	0.198	38.01	-15.70	53.71	27.60	0.04	10.37	Average
3	0.220	57.50	-6.33	62.83	47.10	0.05	10.35	QP
4	0.220	34.30	-18.53	52.83	23.90	0.05	10.35	Average
5	0.269	54.88	-6.28	61.16	44.50	0.06	10.32	QP
6	0.269	32.68	-18.48	51.16	22.30	0.06	10.32	Average
7	0.329	50.97	-8.52	59.49	40.60	0.08	10.29	QP
8	0.329	30.27	-19.22	49.49	19.90	0.08	10.29	Average
9	0.346	50.57	-8.48	59.05	40.20	0.08	10.29	QP
10	0.346	29.67	-19.38	49.05	19.30	0.08	10.29	Average
11	0.507	42.54	-13.46	56.00	32.20	0.10	10.24	QP
12	0.507	25.84	-20.16	46.00	15.50	0.10	10.24	Average
13	0.564	38.84	-17.16	56.00	28.50	0.10	10.24	QP
14	0.564	23.64	-22.36	46.00	13.30	0.10	10.24	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.		



Site : CO01-KS  
 Condition : FCC PART 15C LISN-060105-N NEUTRAL

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.194	54.68	-9.16	63.84	44.21	0.10	10.37	QP
2	0.194	32.08	-21.76	53.84	21.61	0.10	10.37	Average
3 *	0.209	55.06	-8.17	63.23	44.60	0.10	10.36	QP
4	0.209	32.76	-20.47	53.23	22.30	0.10	10.36	Average
5	0.270	51.92	-9.20	61.12	41.50	0.10	10.32	QP
6	0.270	30.62	-20.50	51.12	20.20	0.10	10.32	Average
7	0.327	48.60	-10.93	59.53	38.21	0.10	10.29	QP
8	0.327	26.60	-22.93	49.53	16.21	0.10	10.29	Average
9	0.484	41.85	-14.42	56.27	31.50	0.11	10.24	QP
10	0.484	23.65	-22.62	46.27	13.30	0.11	10.24	Average
11	12.253	39.44	-20.56	60.00	28.80	0.27	10.37	QP
12	12.253	33.44	-16.56	50.00	22.80	0.27	10.37	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

Test Engineer :	Carry Xu	Temperature :	22~23°C
		Relative Humidity :	41~42%

Only the worst mode results are reported.

#### 2.4GHz 2400~2483.5MHz

#### BT (Band Edge @ 3m)

BT	Note	Frequency	Level	Over Limit	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 )
BT CH 78 2480MHz		2480	107.83	-	-	104.42	32.98	7.25	36.82	155	352	P	H
		2480	83.01	-	-	-	-	-	-	-	-	A	H
		2483.68	52.22	-21.78	74	48.81	32.98	7.25	36.82	155	352	P	H
		2483.68	27.40	-26.60	54	-	-	-	-	-	-	A	H
		2480	108.41	-	-	105	32.98	7.25	36.82	100	123	P	V
		2480	83.59	-	-	-	-	-	-	-	-	A	V
		2484.94	49.87	-24.13	74	46.46	32.98	7.25	36.82	100	123	P	V
		2484.94	25.05	-28.95	54	-	-	-	-	-	-	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)

BT	Note	Frequency	Level	Over Limit	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 )
BT CH 78 2480MHz		4965	40.8	-33.2	74	61.58	34.28	10.41	65.47	300	0	P	H
		7440	41.62	-32.38	74	59.25	35.89	12.79	66.31	300	0	P	H
		4965	41.69	-32.31	74	62.47	34.28	10.41	65.47	100	0	P	V
		7440	42.74	-31.26	74	60.37	35.89	12.79	66.31	100	0	P	V
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	Path	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		95.96	27.48	-16.02	43.5	41.48	17.26	1.48	32.74	-	-	P	H
		156.1	25.73	-17.77	43.5	39.31	17.36	1.9	32.84	-	-	P	H
		209.45	24.88	-18.62	43.5	38.88	16.9	2.2	33.1	-	-	P	H
		444.19	21.48	-24.52	46	27.47	23.5	3.22	32.71	-	-	P	H
		627.52	26.06	-19.94	46	29.13	25.72	3.82	32.61	-	-	P	H
		889.42	33.02	-12.98	46	33.62	27.36	4.56	32.52	-	-	P	H
		94.02	31.28	-12.22	43.5	45.66	16.84	1.46	32.68	-	-	P	V
		156.1	30.62	-12.88	43.5	44.2	17.36	1.9	32.84	-	-	P	V
		208.48	26.65	-16.85	43.5	40.71	16.84	2.2	33.1	-	-	P	V
		429.64	21.01	-24.99	46	27.35	23.24	3.16	32.74	-	-	P	V
		696.39	26.56	-19.44	46	29.59	25.72	4.04	32.79	-	-	P	V
		834.13	28.85	-17.15	46	29.9	27.11	4.41	32.57	-	-	P	V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												



**Note symbol**

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



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

BT	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
		( MHz )	( dBμV/m )	( dB )	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
					( dBμV/m )	( dBμV )	( dB/m )	( dB )	( dB )	( cm )	( deg )	( P/A )	( H/V )
BT		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
CH 00		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H
2402MHz													

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. Over Limit(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. Over Limit(dB)  
= Level(dBμV/m) – Limit Line(dBμV/m)  
= 55.45(dBμV/m) – 74(dBμV/m)  
= -18.55(dB)

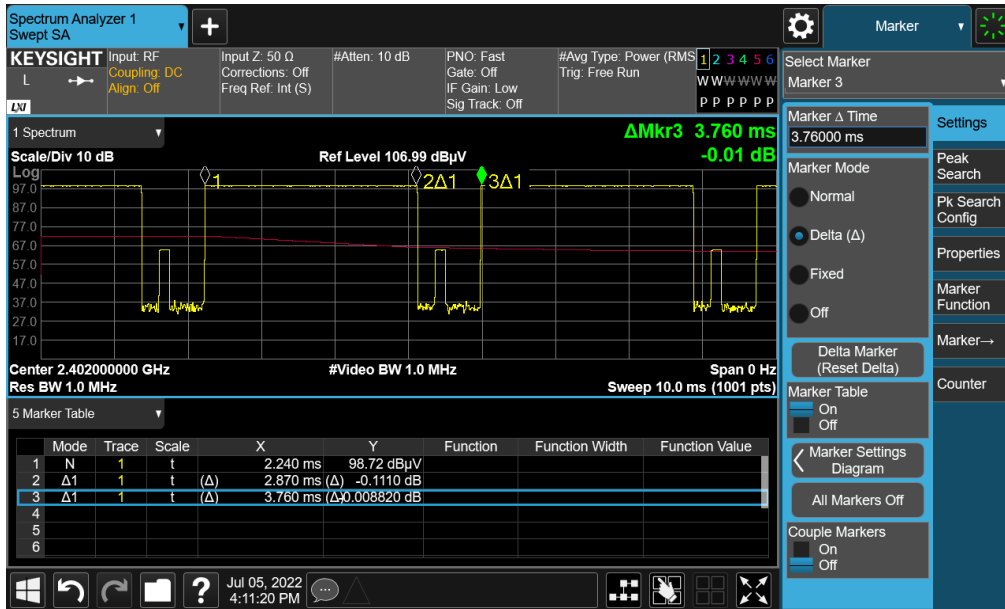
**For Average Limit @ 2390MHz:**

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. Over Limit(dB)  
= Level(dBμV/m) – Limit Line(dBμV/m)  
= 43.54(dBμV/m) – 54(dBμV/m)  
= -10.46(dB)

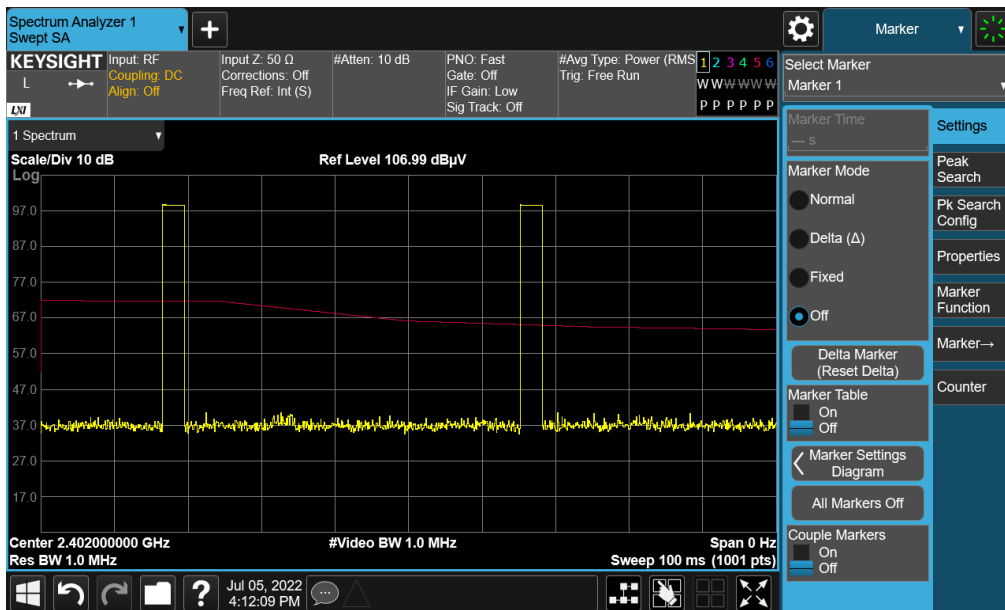
Both peak and average measured complies with the limit line, so test result is “PASS”.

## 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 =  $2 * 2.87 / 100 = 5.74 \%$
2. Worst case Duty cycle correction factor =  $20 * \log(\text{Duty cycle}) = -24.82 \text{ dB}$
3. 3DH5 has the highest duty cycle worst case and is reported.