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Annex for Bluetooth Low Energy
Test Report No.: CTL2411057011-WR01

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1. Duty Cycle - SA

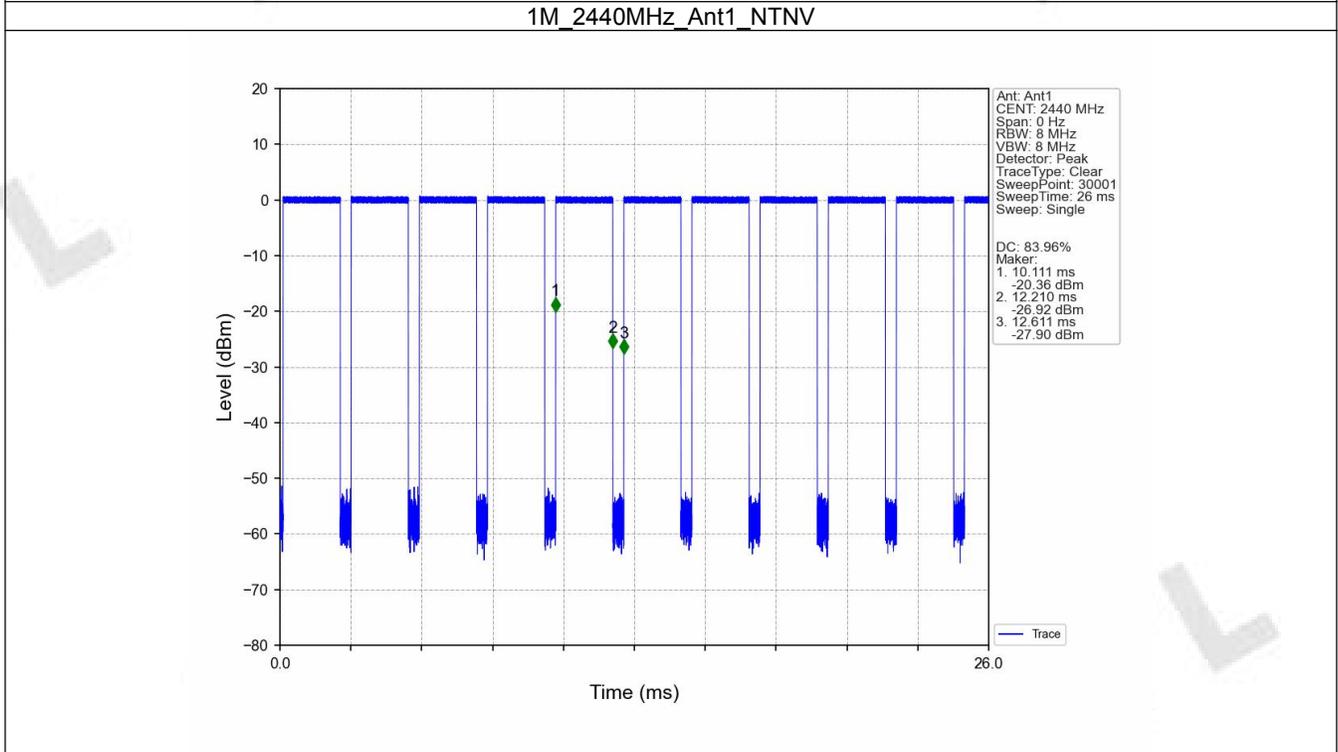
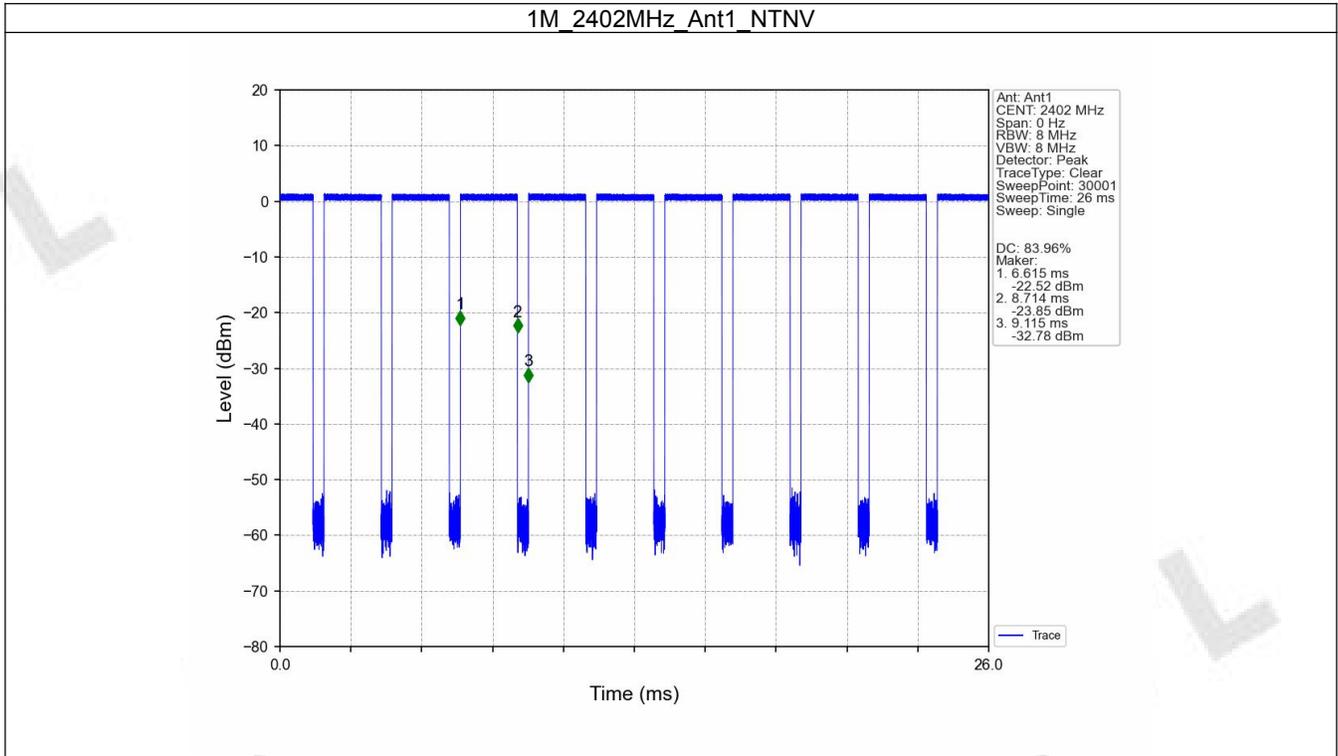
1.1 Test Result

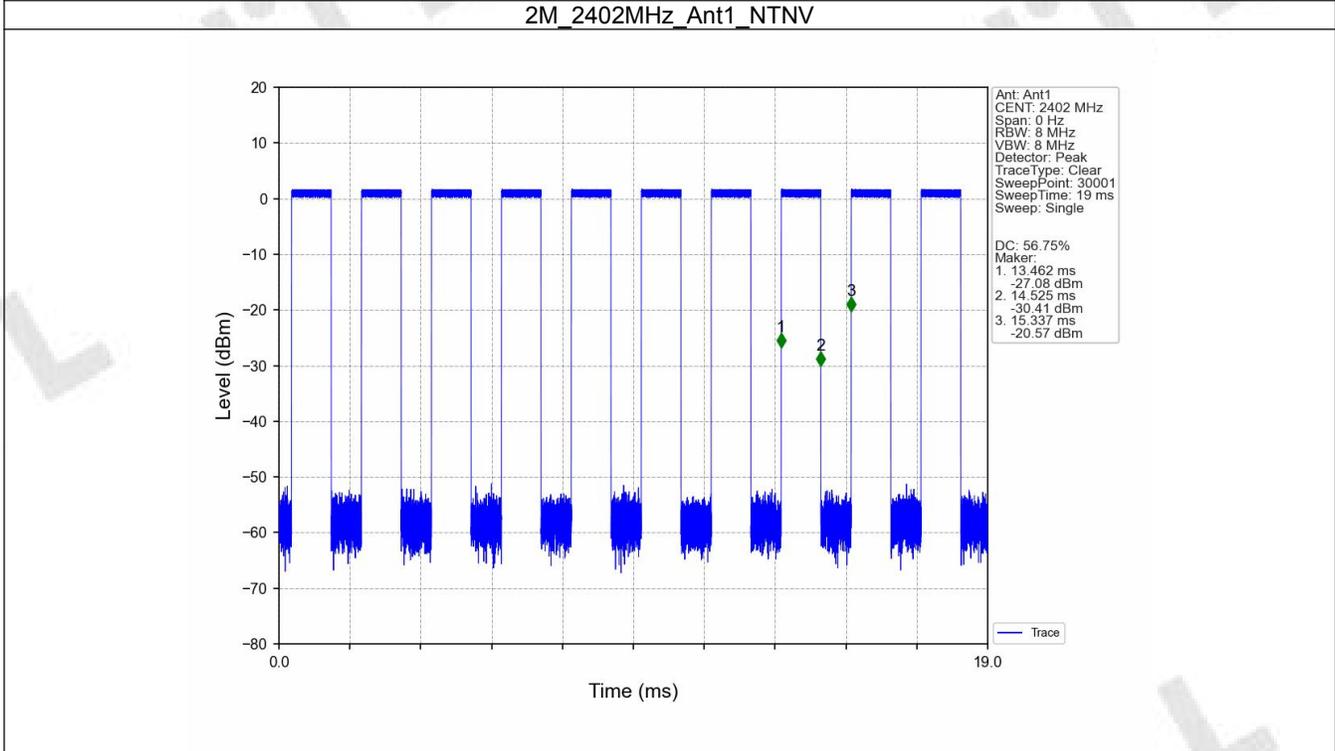
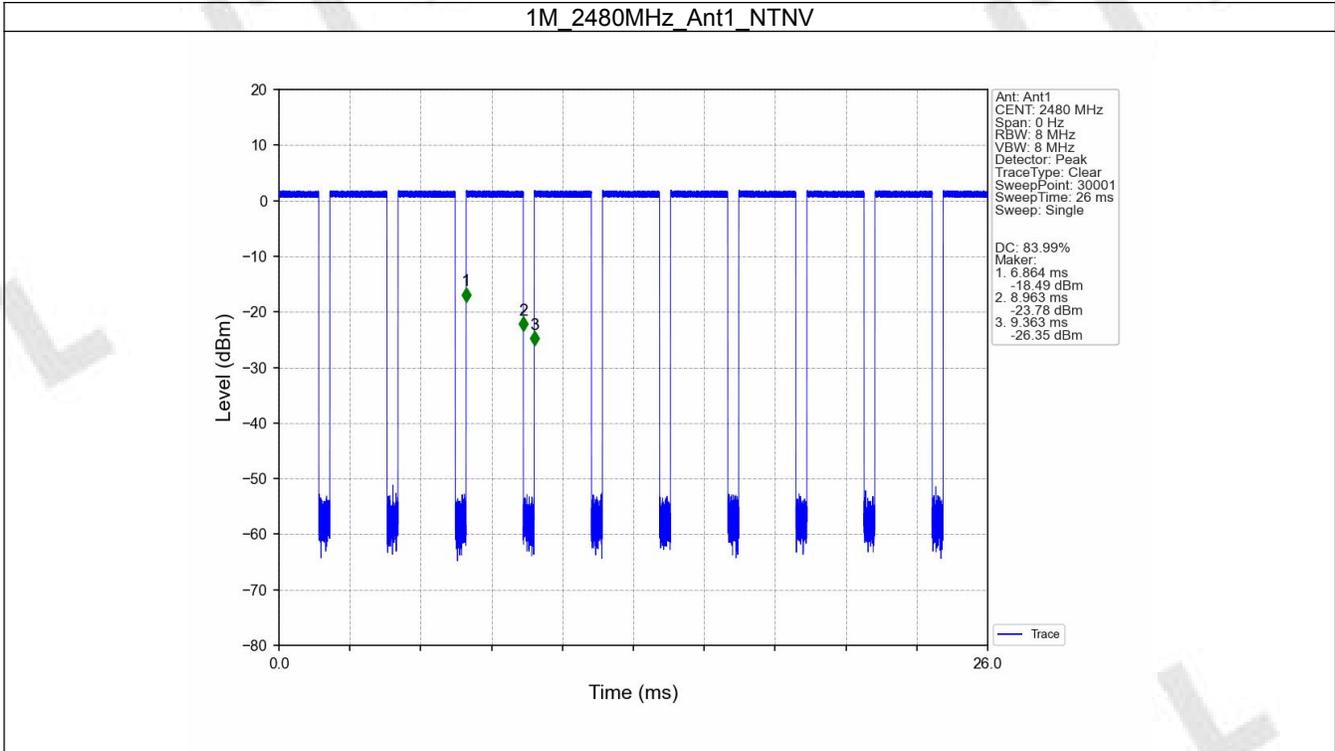
1.1.1 Ant1

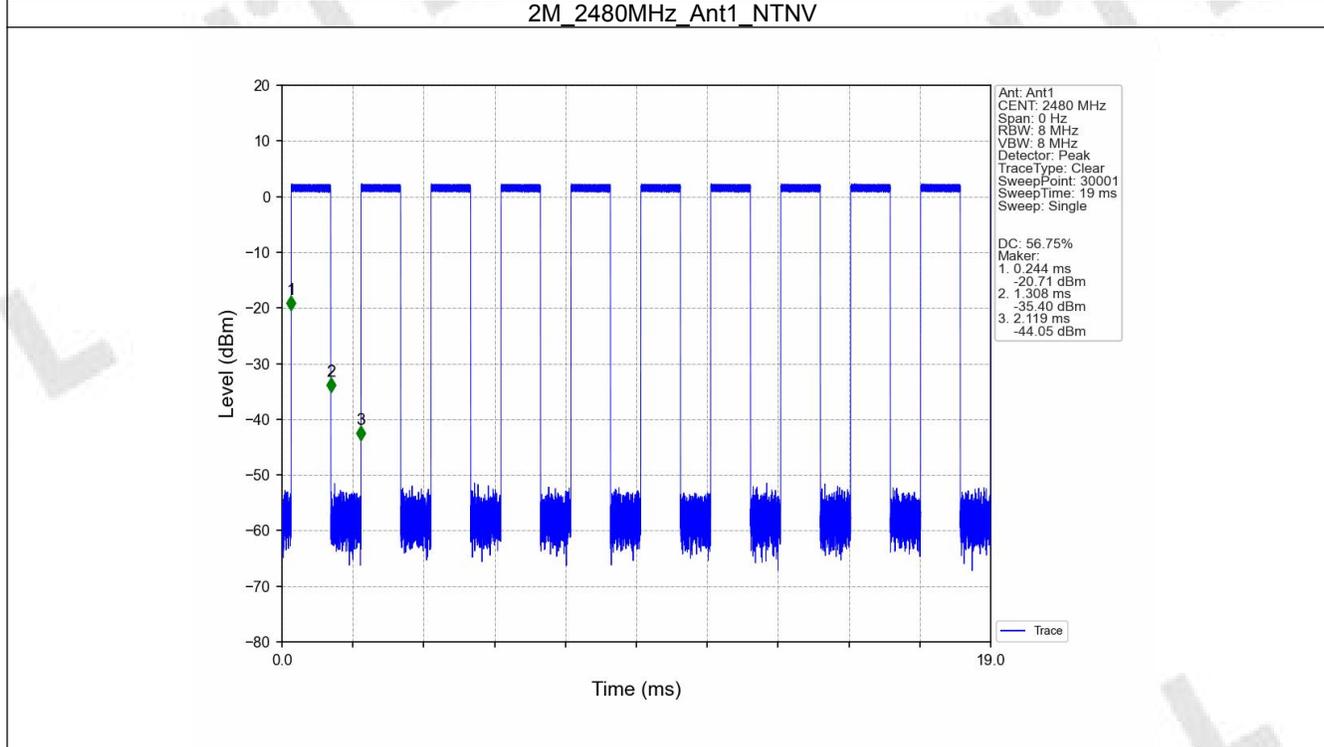
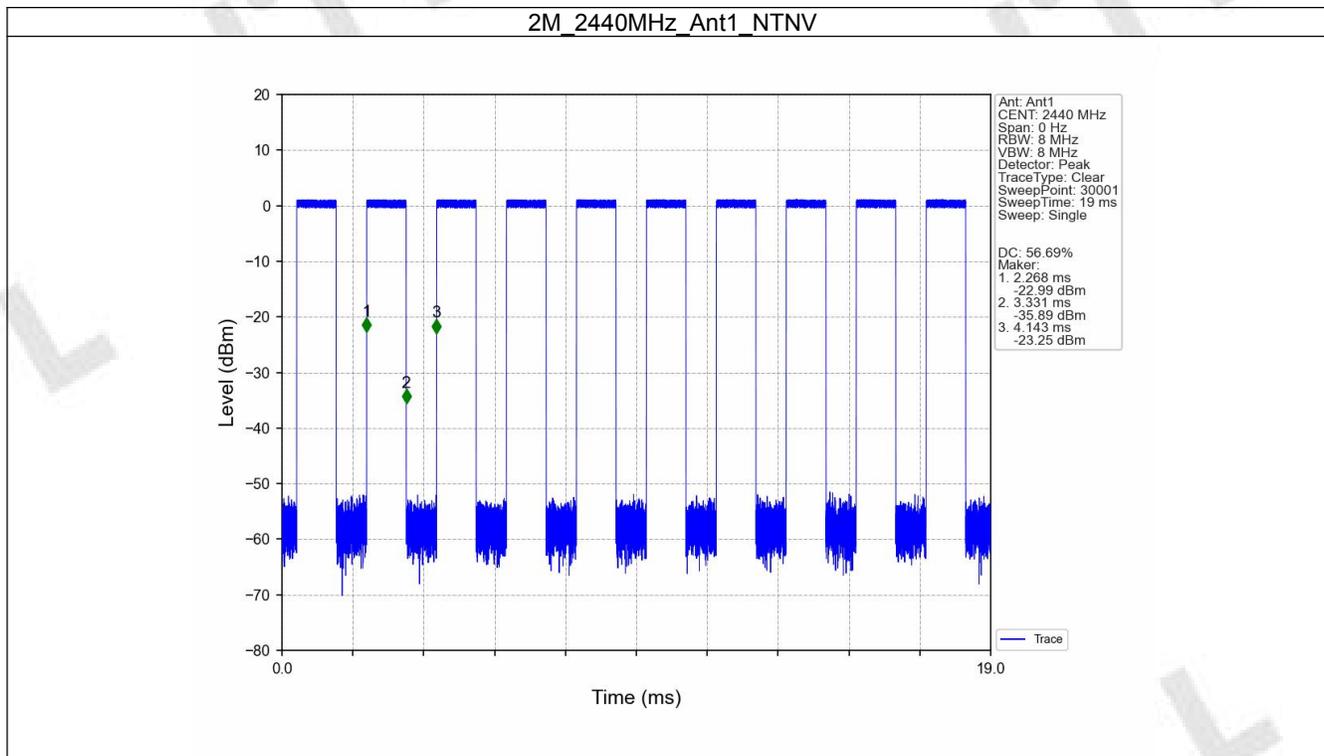
Ant1								
ENV	Mode	TX Type	Frequency (MHz)	T_on (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	Max. DC Variation (%)
NTNV	1M	SISO	2402	2.099	2.500	83.96	0.76	0.03
			2440	2.099	2.500	83.96	0.76	0.03
			2480	2.099	2.499	83.99	0.76	0.03
	2M	SISO	2402	1.064	1.875	56.75	2.46	0.03
			2440	1.063	1.875	56.69	2.46	0.03
			2480	1.064	1.875	56.75	2.46	0.01

1.2 Test Graph

1.2.1 Ant1







2. RF Output Power, Duty Cycle, Tx-sequence, Tx-gap, Medium Utilization

2.1 Test Result

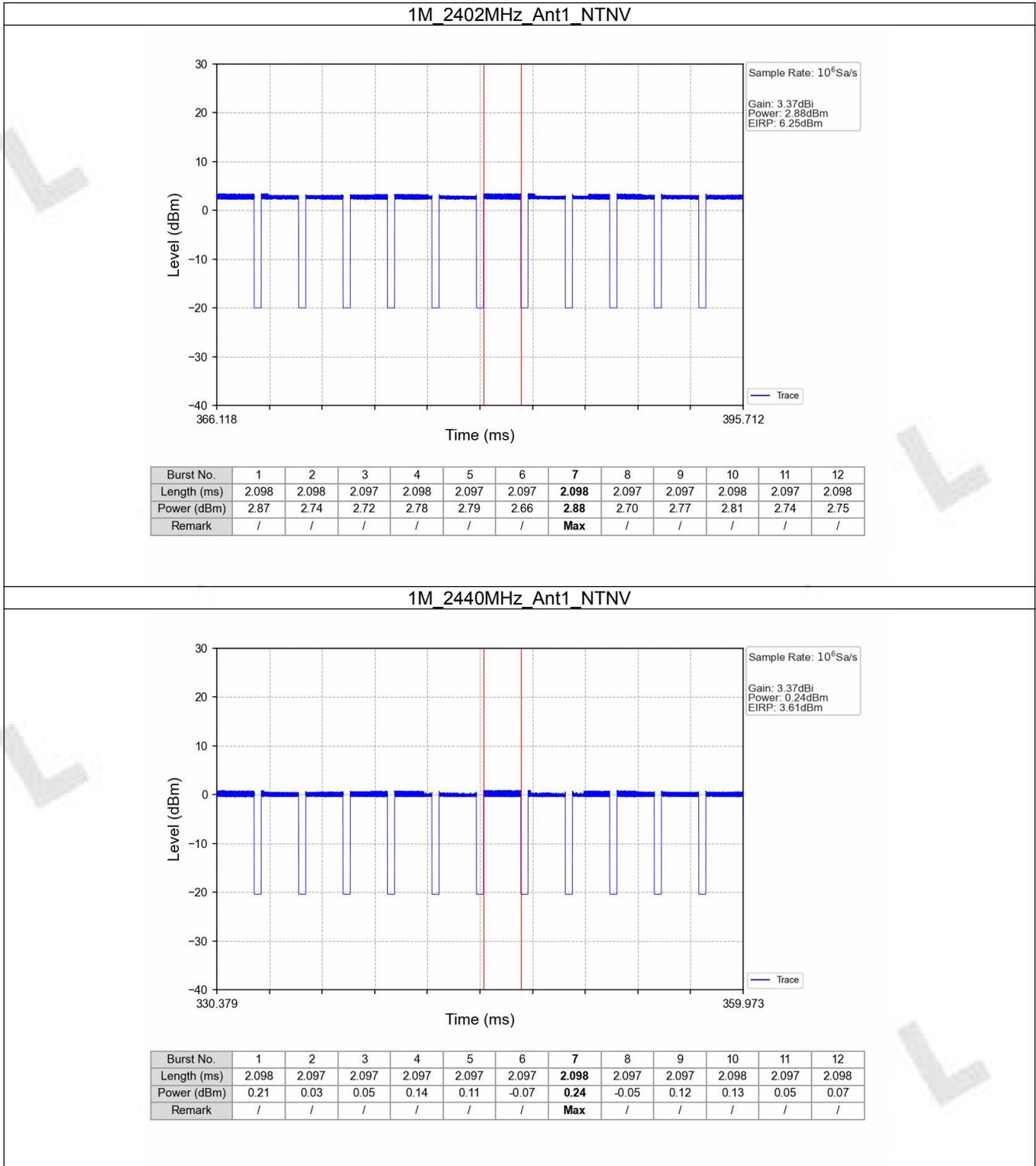
2.1.1 Power

ENV	Mode	TX Type	Frequency (MHz)	ANT	Gain (dBi)	Power (dBm)	EIRP (dBm)	Limit (dBm)	Verdict
NTNV	1M	SISO	2402	1	3.37	2.88	6.25	<=20	Pass
			2440	1	3.37	0.24	3.61	<=20	Pass
			2480	1	3.37	2.50	5.87	<=20	Pass
	2M	SISO	2402	1	3.37	3.08	6.45	<=20	Pass
			2440	1	3.37	0.54	3.91	<=20	Pass
			2480	1	3.37	2.80	6.17	<=20	Pass
HTNV	1M	SISO	2402	1	3.37	2.86	6.23	<=20	Pass
			2440	1	3.37	0.23	3.60	<=20	Pass
			2480	1	3.37	2.49	5.86	<=20	Pass
	2M	SISO	2402	1	3.37	3.10	6.47	<=20	Pass
			2440	1	3.37	0.55	3.92	<=20	Pass
			2480	1	3.37	2.80	6.17	<=20	Pass
LTVN	1M	SISO	2402	1	3.37	2.86	6.23	<=20	Pass
			2440	1	3.37	0.23	3.60	<=20	Pass
			2480	1	3.37	2.49	5.86	<=20	Pass
	2M	SISO	2402	1	3.37	3.10	6.47	<=20	Pass
			2440	1	3.37	0.55	3.92	<=20	Pass
			2480	1	3.37	2.80	6.17	<=20	Pass

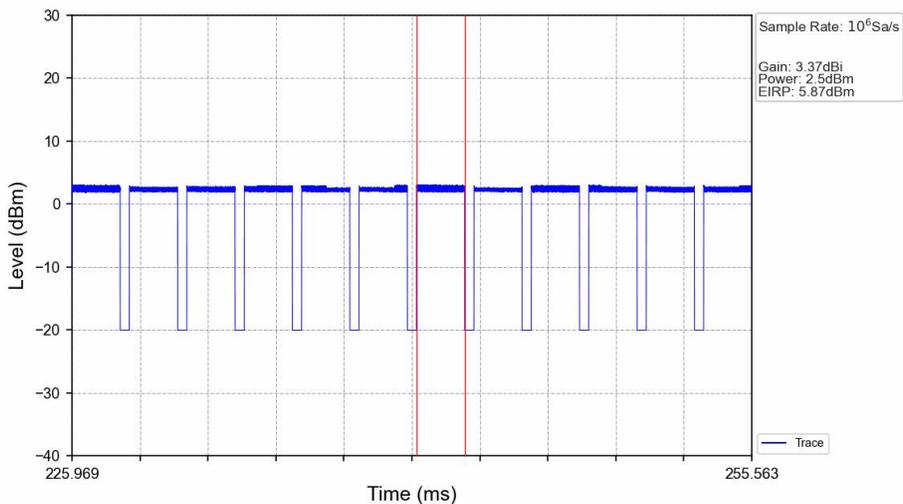
Note1: E.I.R.P = Measured Power + Antenna Gain

2.2 Test Graph

2.2.1 Power

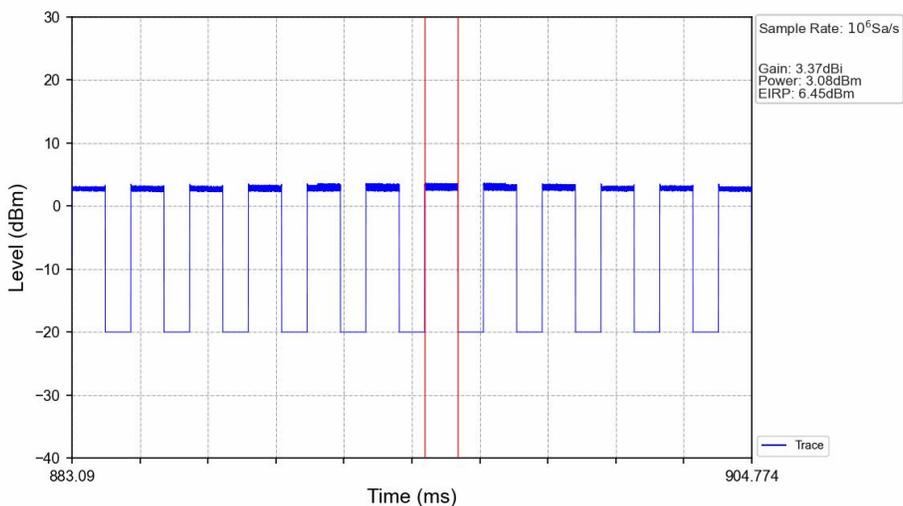


1M_2480MHz_Ant1_NTNV



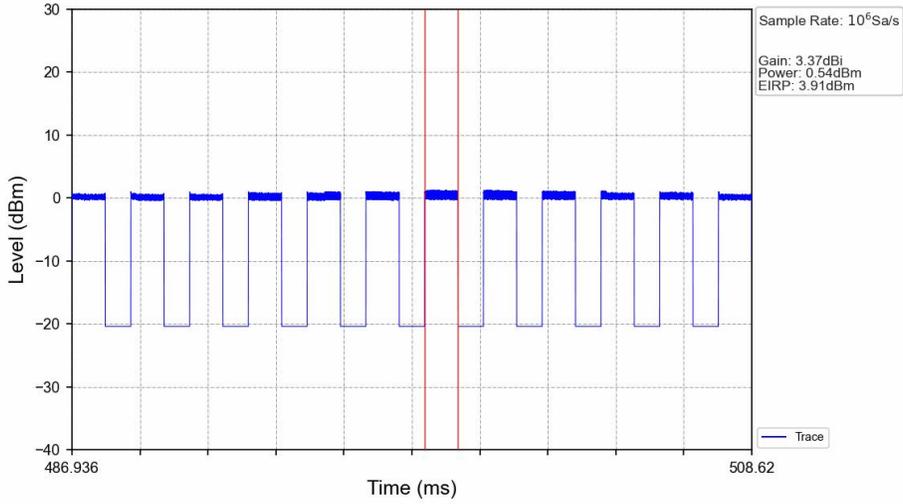
Burst No.	1	2	3	4	5	6	7	8	9	10	11	12
Length (ms)	2.098	2.098	2.097	2.098	2.097	2.097	2.097	2.097	2.097	2.098	2.097	2.098
Power (dBm)	2.48	2.34	2.37	2.44	2.37	2.36	2.50	2.28	2.46	2.39	2.35	2.38
Remark	/	/	/	/	/	/	Max	/	/	/	/	/

2M_2402MHz_Ant1_NTNV



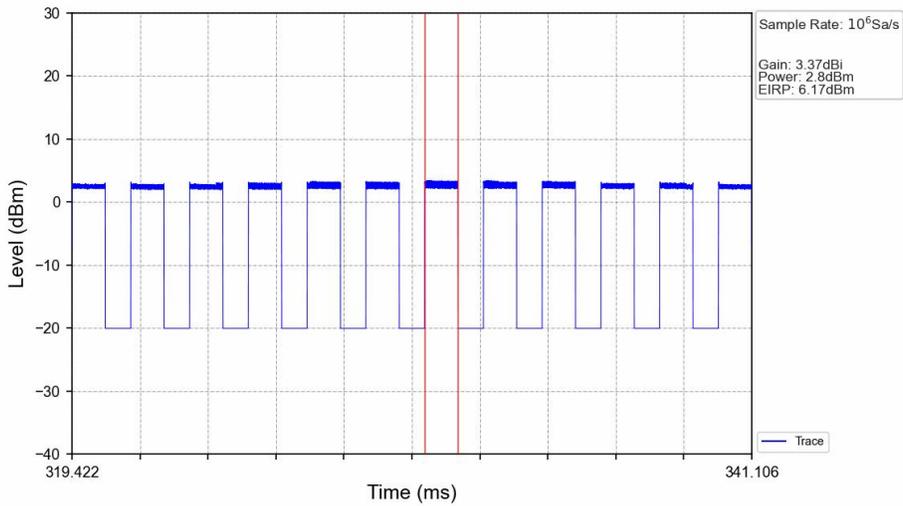
Burst No.	1	2	3	4	5	6	7	8	9	10	11	12
Length (ms)	1.062	1.061	1.061	1.062	1.062	1.062	1.061	1.061	1.062	1.061	1.061	1.062
Power (dBm)	2.77	2.75	2.73	2.85	2.96	2.99	3.08	3.04	2.99	2.82	2.85	2.71
Remark	/	/	/	/	/	/	Max	/	/	/	/	/

2M_2440MHz_Ant1_NTNV



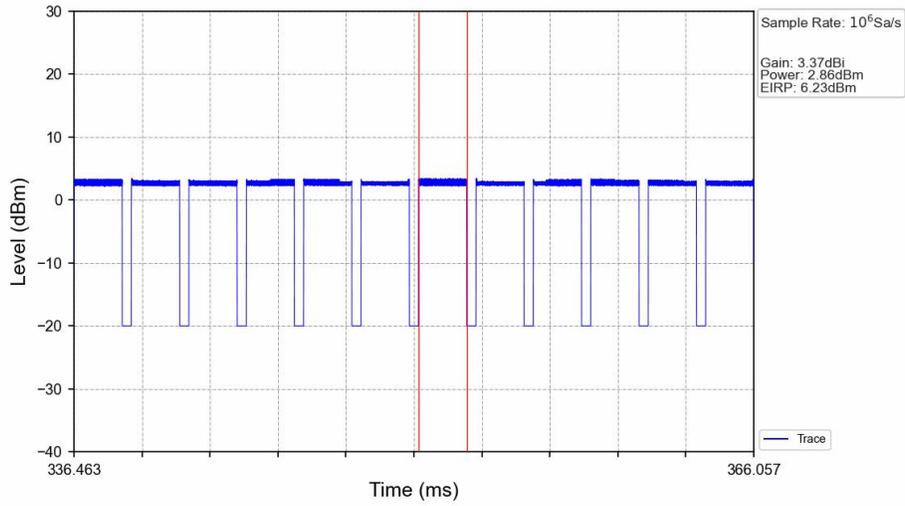
Burst No.	1	2	3	4	5	6	7	8	9	10	11	12
Length (ms)	1.062	1.061	1.061	1.062	1.062	1.061	1.061	1.061	1.062	1.061	1.061	1.062
Power (dBm)	0.17	0.12	0.10	0.25	0.31	0.38	0.54	0.52	0.46	0.34	0.36	0.14
Remark	/	/	/	/	/	/	Max	/	/	/	/	/

2M_2480MHz_Ant1_NTNV



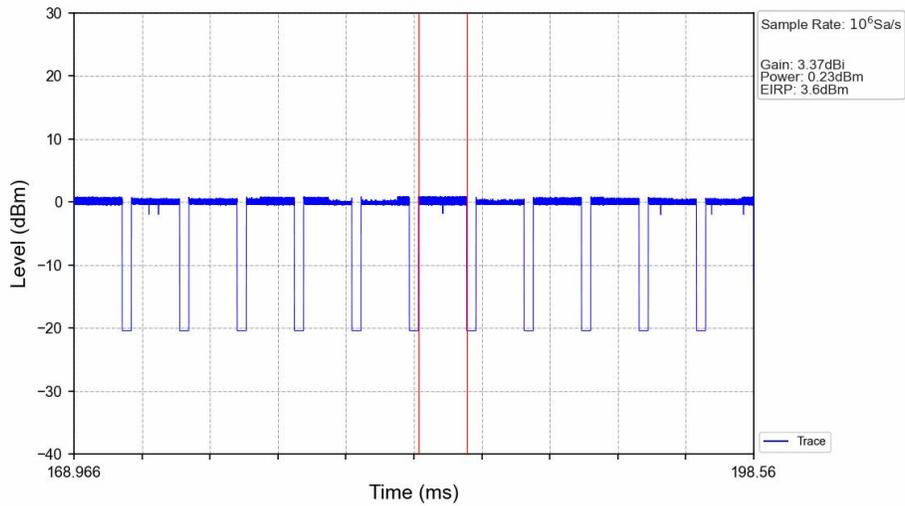
Burst No.	1	2	3	4	5	6	7	8	9	10	11	12
Length (ms)	1.062	1.061	1.061	1.062	1.062	1.062	1.061	1.061	1.062	1.061	1.061	1.062
Power (dBm)	2.52	2.44	2.46	2.54	2.68	2.66	2.80	2.76	2.74	2.59	2.59	2.46
Remark	/	/	/	/	/	/	Max	/	/	/	/	/

1M_2402MHz_Ant1_HTNV



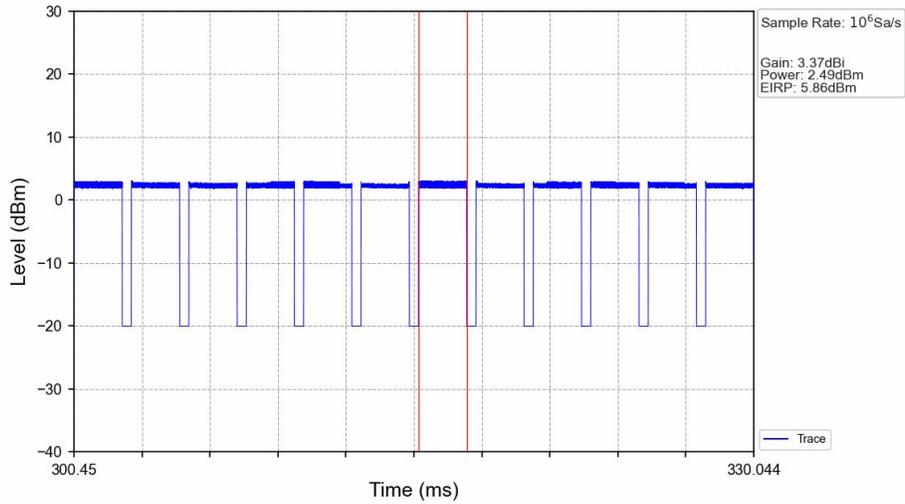
Burst No.	1	2	3	4	5	6	7	8	9	10	11	12
Length (ms)	2.098	2.098	2.097	2.098	2.097	2.097	2.098	2.097	2.097	2.098	2.097	2.097
Power (dBm)	2.83	2.72	2.71	2.77	2.78	2.66	2.86	2.66	2.77	2.78	2.72	2.68
Remark	/	/	/	/	/	/	Max	/	/	/	/	/

1M_2440MHz_Ant1_HTNV



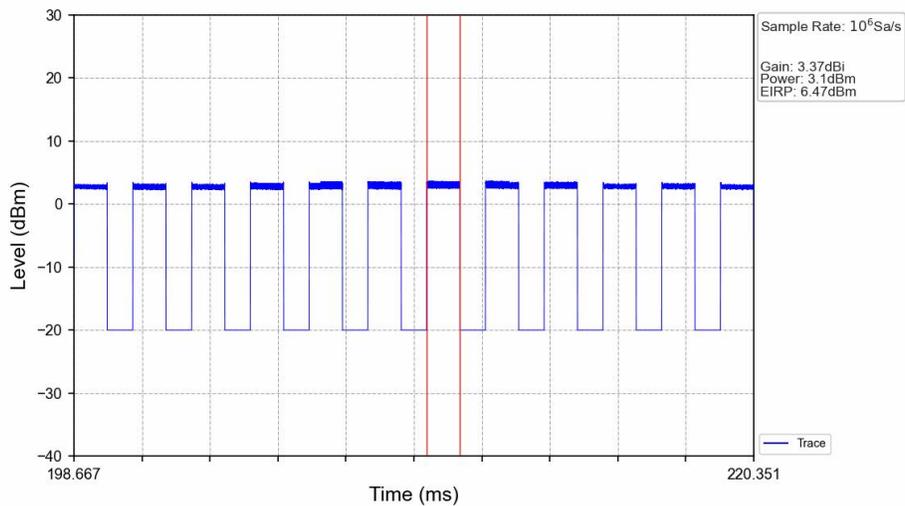
Burst No.	1	2	3	4	5	6	7	8	9	10	11	12
Length (ms)	2.097	2.097	2.097	2.098	2.097	2.097	2.097	2.097	2.097	2.098	2.097	2.097
Power (dBm)	0.18	0.04	0.04	0.15	0.05	-0.01	0.23	-0.06	0.15	0.10	0.03	0.05
Remark	/	/	/	/	/	/	Max	/	/	/	/	/

1M_2480MHz_Ant1_HTNV



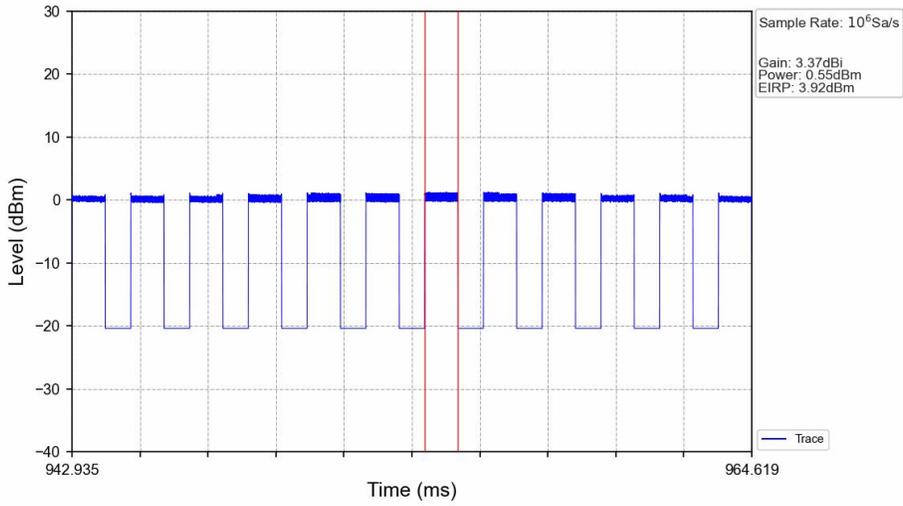
Burst No.	1	2	3	4	5	6	7	8	9	10	11	12
Length (ms)	2.098	2.098	2.097	2.098	2.097	2.097	2.098	2.097	2.097	2.098	2.097	2.097
Power (dBm)	2.46	2.37	2.33	2.40	2.40	2.26	2.49	2.30	2.39	2.41	2.37	2.33
Remark	/	/	/	/	/	/	Max	/	/	/	/	/

2M_2402MHz_Ant1_HTNV



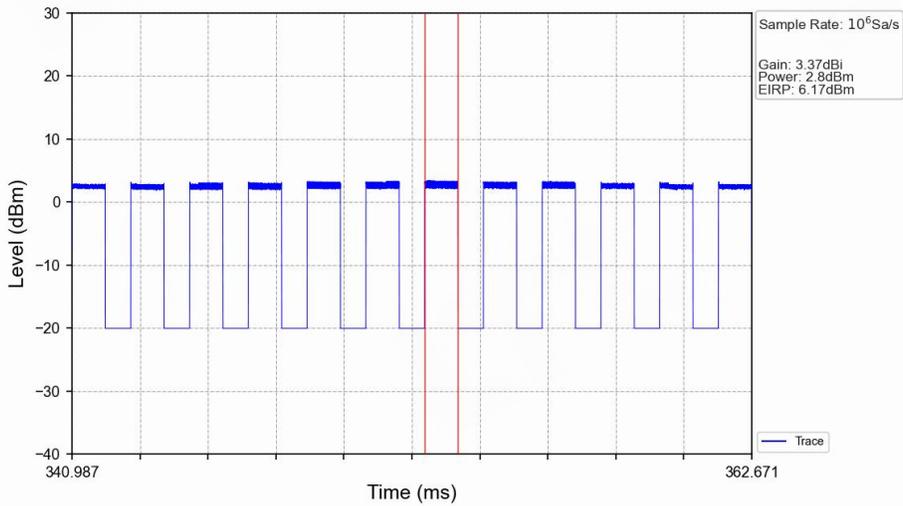
Burst No.	1	2	3	4	5	6	7	8	9	10	11	12
Length (ms)	1.062	1.061	1.061	1.062	1.062	1.062	1.061	1.061	1.062	1.061	1.061	1.062
Power (dBm)	2.77	2.75	2.73	2.85	2.96	3.00	3.10	3.06	3.01	2.83	2.87	2.74
Remark	/	/	/	/	/	/	Max	/	/	/	/	/

2M_2440MHz_Ant1_HTNV



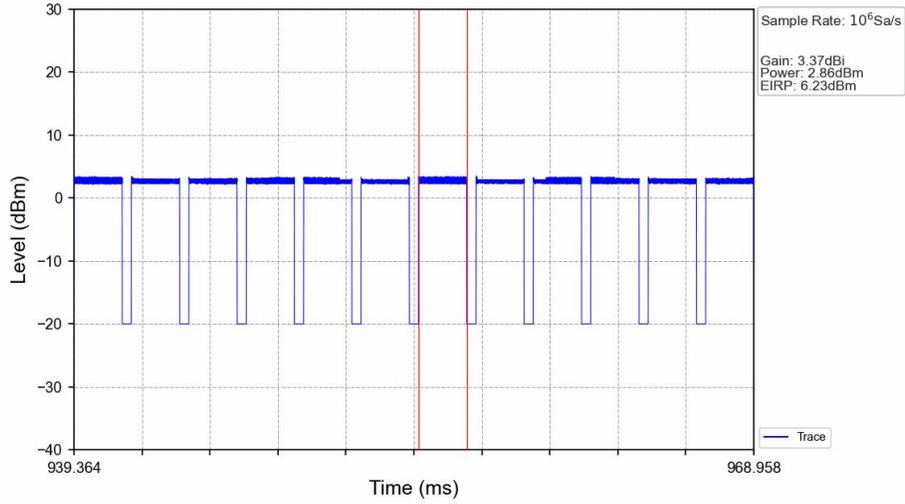
Burst No.	1	2	3	4	5	6	7	8	9	10	11	12
Length (ms)	1.062	1.061	1.061	1.062	1.062	1.062	1.062	1.062	1.062	1.061	1.061	1.062
Power (dBm)	0.17	0.13	0.15	0.28	0.42	0.41	0.55	0.49	0.46	0.28	0.29	0.13
Remark	/	/	/	/	/	/	Max	/	/	/	/	/

2M_2480MHz_Ant1_HTNV



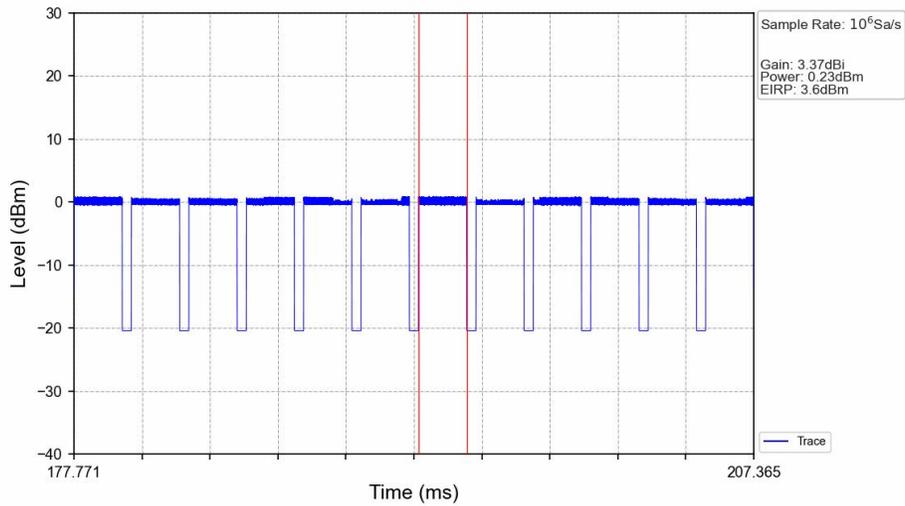
Burst No.	1	2	3	4	5	6	7	8	9	10	11	12
Length (ms)	1.061	1.061	1.061	1.062	1.062	1.061	1.061	1.062	1.061	1.061	1.061	1.062
Power (dBm)	2.51	2.42	2.53	2.54	2.69	2.72	2.80	2.70	2.72	2.59	2.50	2.46
Remark	/	/	/	/	/	/	Max	/	/	/	/	/

1M_2402MHz_Ant1_LTNV



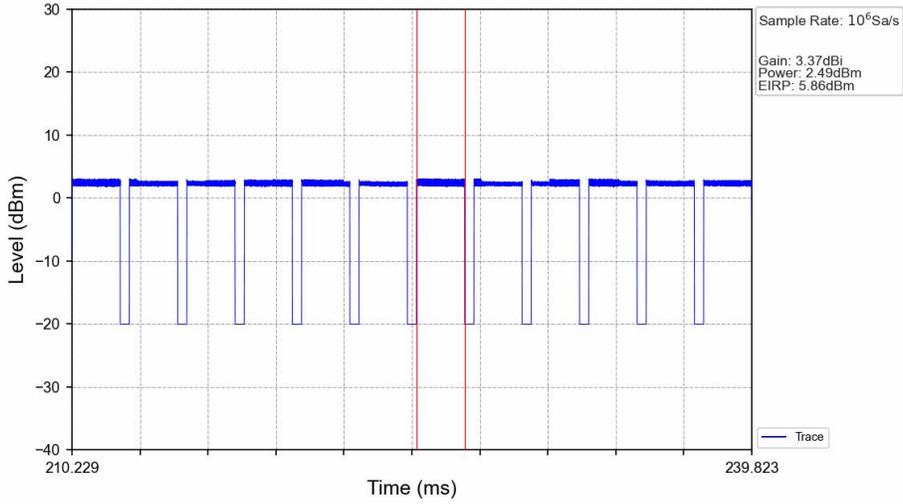
Burst No.	1	2	3	4	5	6	7	8	9	10	11	12
Length (ms)	2.098	2.098	2.097	2.098	2.097	2.097	2.098	2.097	2.097	2.098	2.097	2.098
Power (dBm)	2.84	2.70	2.71	2.77	2.75	2.64	2.86	2.64	2.78	2.78	2.72	2.73
Remark	/	/	/	/	/	/	Max	/	/	/	/	/

1M_2440MHz_Ant1_LTNV



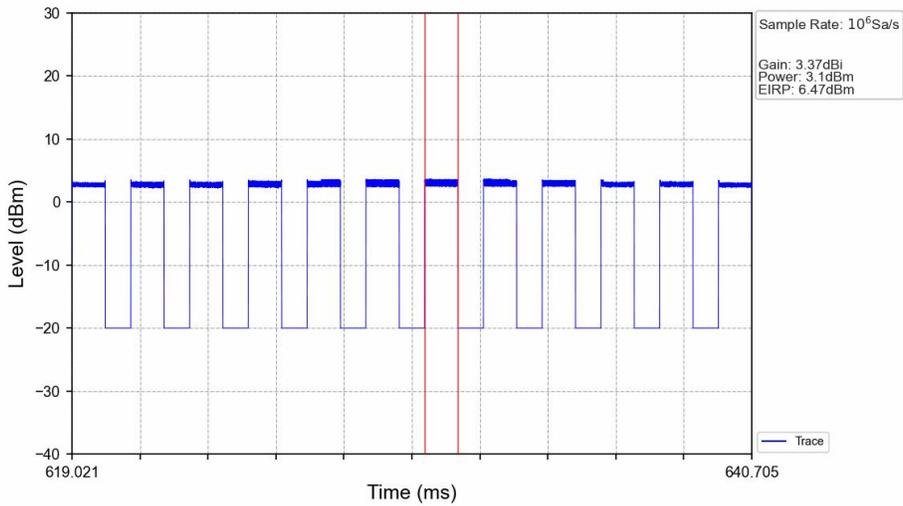
Burst No.	1	2	3	4	5	6	7	8	9	10	11	12
Length (ms)	2.098	2.097	2.097	2.097	2.097	2.097	2.098	2.097	2.097	2.098	2.097	2.097
Power (dBm)	0.19	0.02	0.04	0.14	0.07	-0.02	0.23	-0.08	0.13	0.09	0.01	0.02
Remark	/	/	/	/	/	/	Max	/	/	/	/	/

1M_2480MHz_Ant1_LTNV



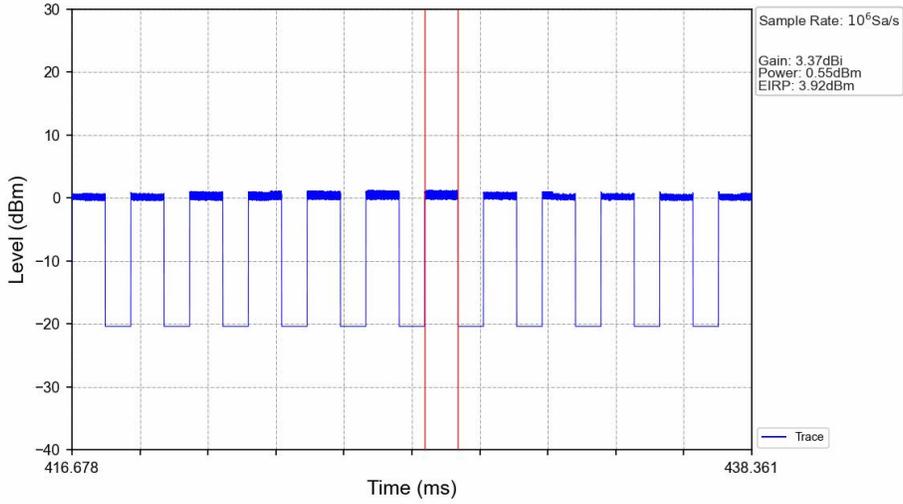
Burst No.	1	2	3	4	5	6	7	8	9	10	11	12
Length (ms)	2.098	2.098	2.097	2.098	2.097	2.097	2.098	2.097	2.097	2.098	2.097	2.098
Power (dBm)	2.48	2.34	2.35	2.41	2.39	2.27	2.49	2.30	2.39	2.42	2.34	2.38
Remark	/	/	/	/	/	/	Max	/	/	/	/	/

2M_2402MHz_Ant1_LTNV



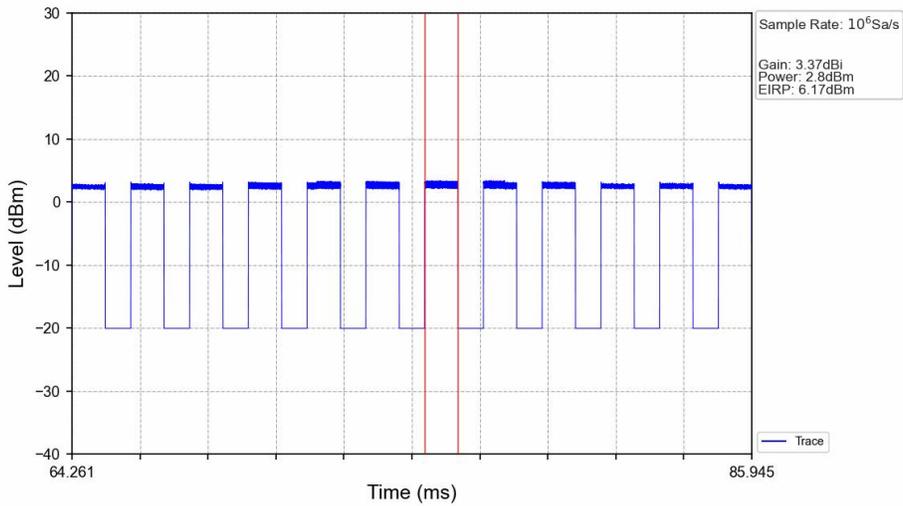
Burst No.	1	2	3	4	5	6	7	8	9	10	11	12
Length (ms)	1.062	1.061	1.061	1.062	1.062	1.062	1.061	1.061	1.062	1.061	1.061	1.062
Power (dBm)	2.77	2.77	2.75	2.88	2.97	3.02	3.10	3.07	3.00	2.84	2.86	2.73
Remark	/	/	/	/	/	/	Max	/	/	/	/	/

2M_2440MHz_Ant1_LTNV



Burst No.	1	2	3	4	5	6	7	8	9	10	11	12
Length (ms)	1.061	1.061	1.061	1.062	1.062	1.061	1.061	1.062	1.061	1.061	1.062	1.061
Power (dBm)	0.17	0.16	0.36	0.36	0.47	0.54	0.55	0.40	0.25	0.22	0.12	0.15
Remark	/	/	/	/	/	/	Max	/	/	/	/	/

2M_2480MHz_Ant1_LTNV



Burst No.	1	2	3	4	5	6	7	8	9	10	11	12
Length (ms)	1.062	1.061	1.061	1.062	1.062	1.062	1.061	1.061	1.062	1.061	1.061	1.062
Power (dBm)	2.45	2.44	2.42	2.61	2.69	2.70	2.80	2.75	2.68	2.55	2.58	2.46
Remark	/	/	/	/	/	/	Max	/	/	/	/	/

3. Power Spectral Density

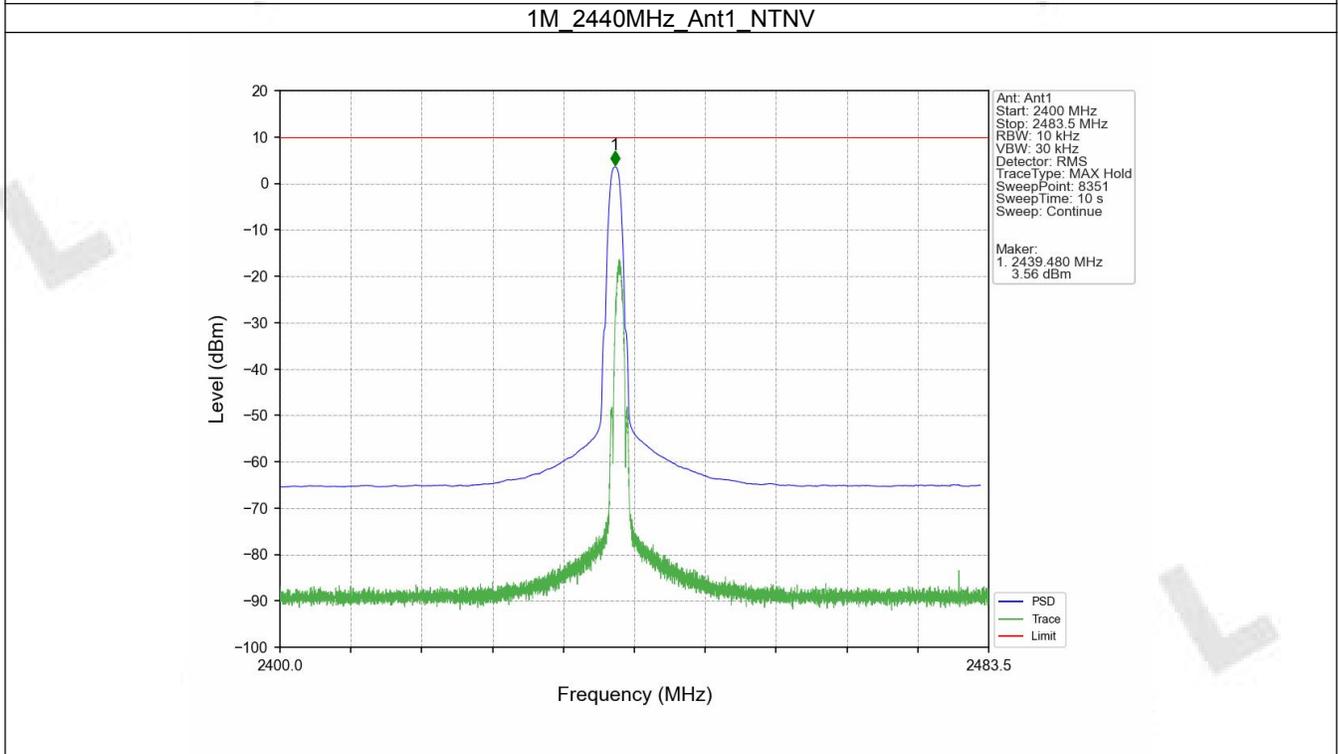
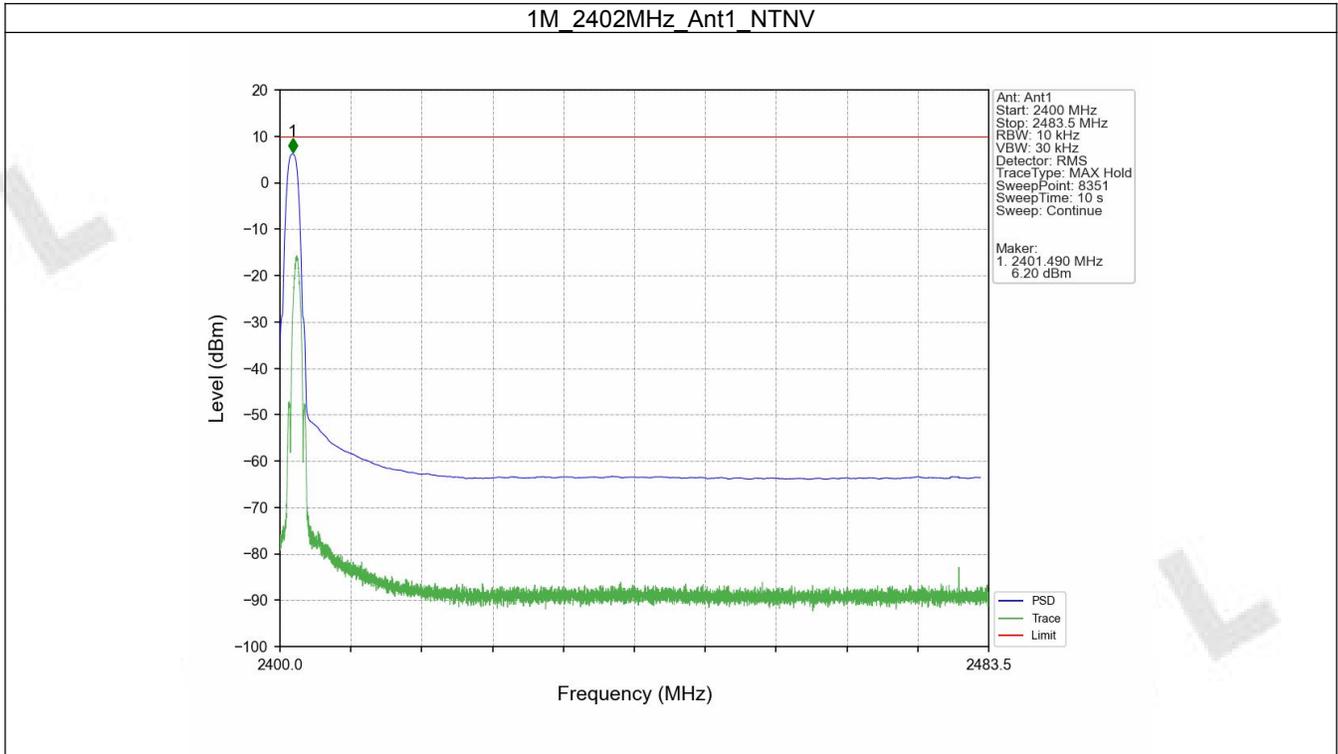
3.1 Test Result

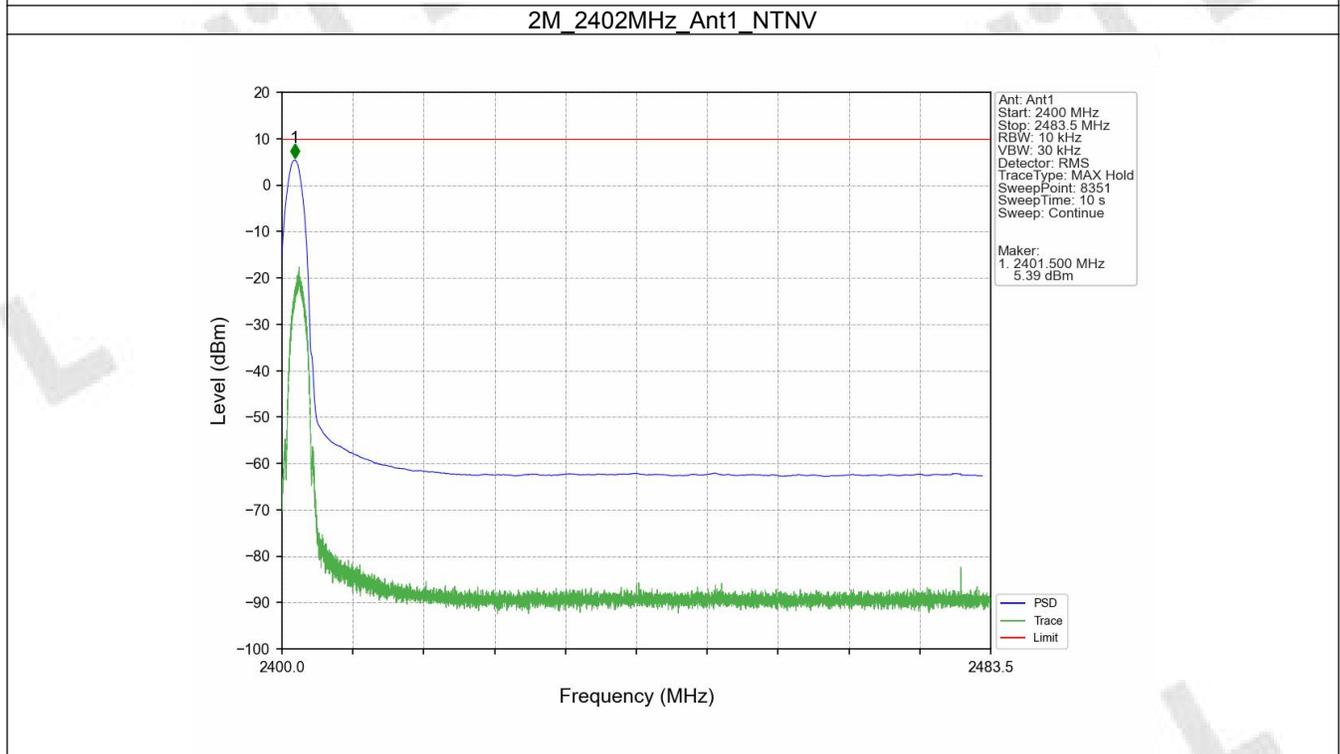
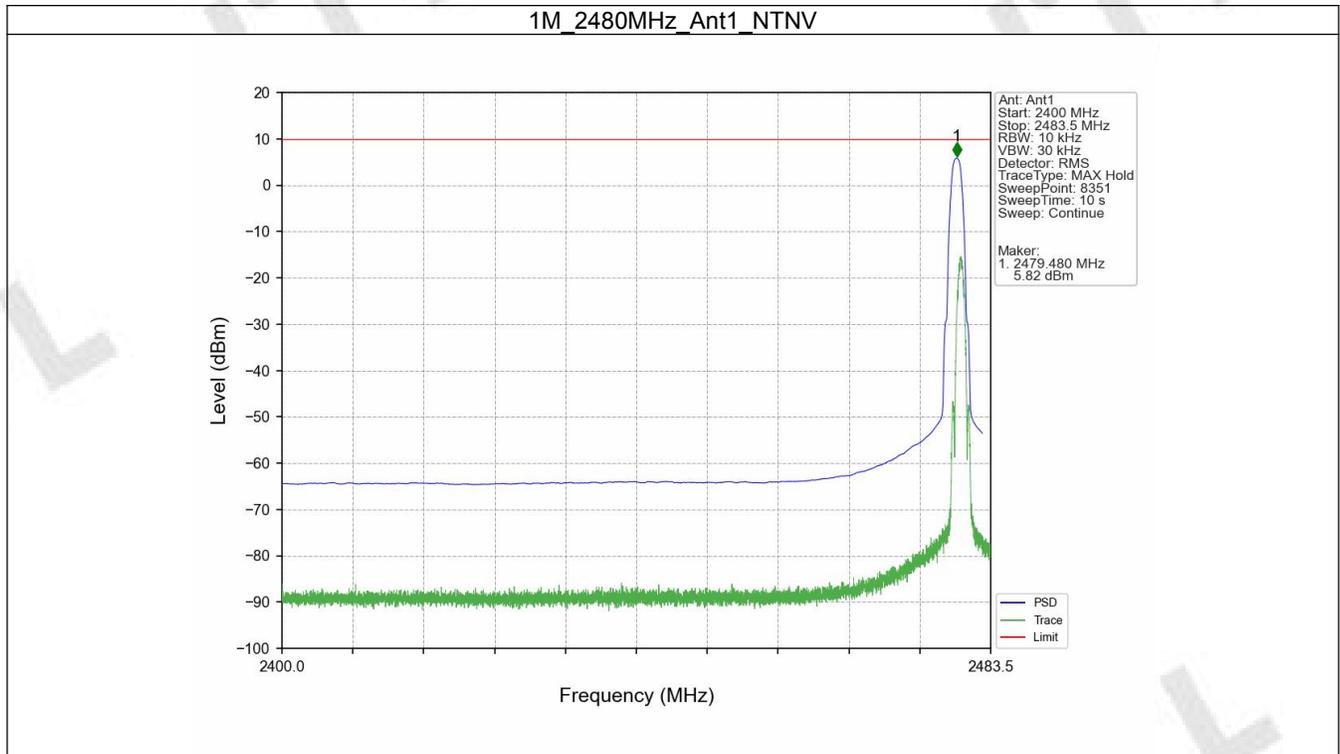
3.1.1 PSD

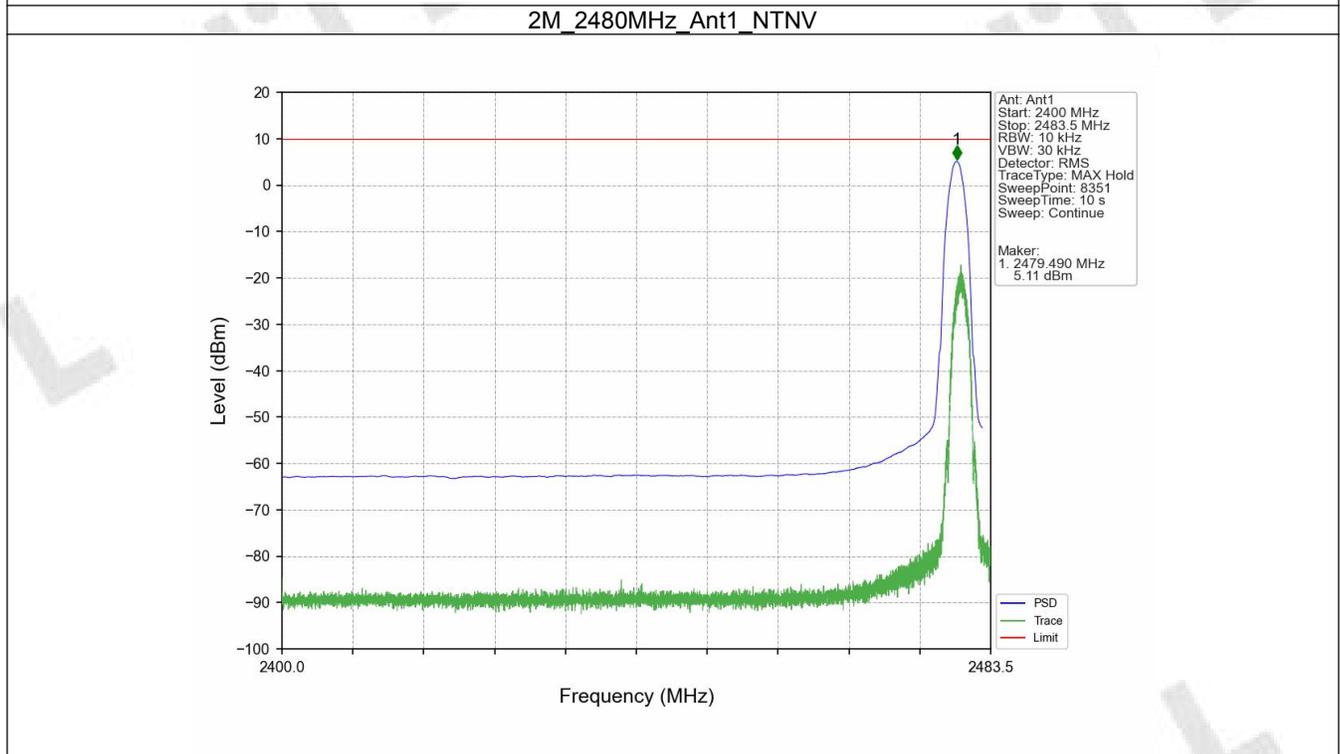
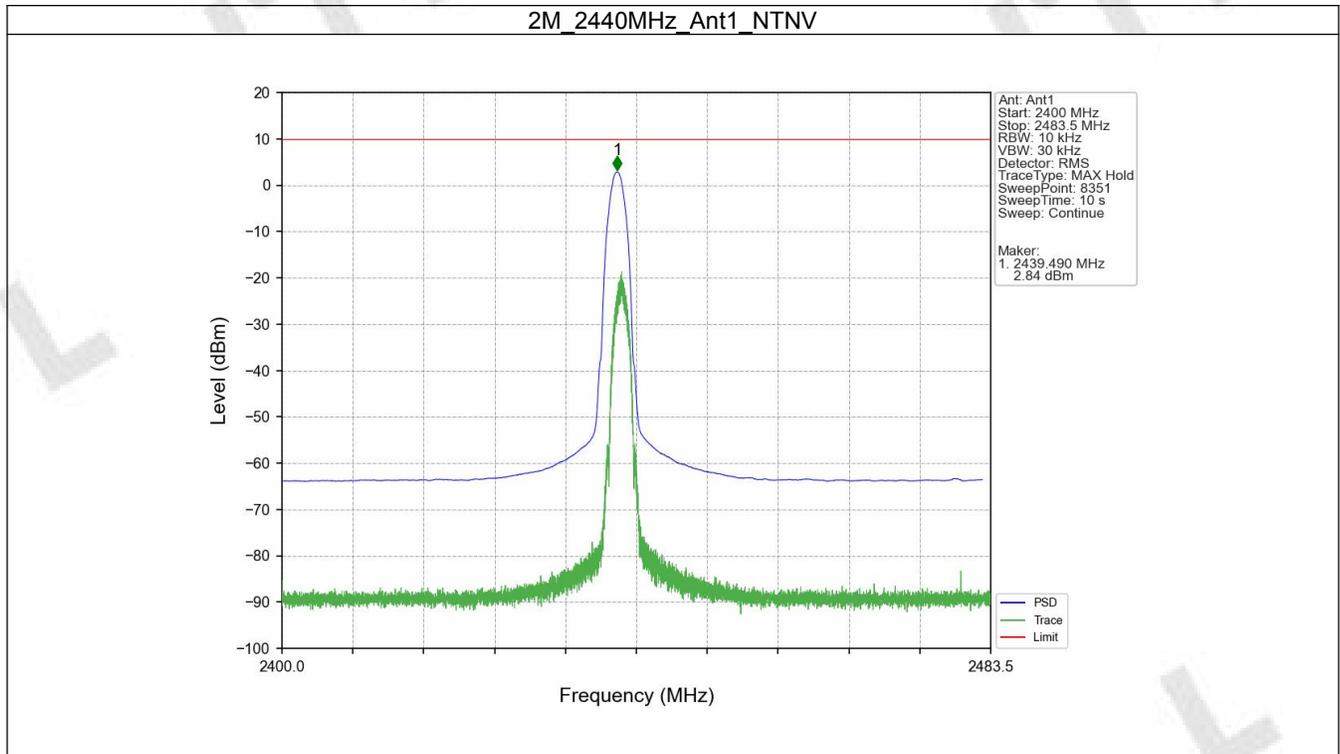
ENV	Mode	TX Type	Frequency (MHz)	ANT	E.I.R.PSD (dBm/MHz)	Limit (dBm/MHz)	Verdict
NTNV	1M	SISO	2402	1	6.20	<=10	Pass
			2440	1	3.56	<=10	Pass
			2480	1	5.82	<=10	Pass
	2M	SISO	2402	1	5.39	<=10	Pass
			2440	1	2.84	<=10	Pass
			2480	1	5.11	<=10	Pass

3.2 Test Graph

3.2.1 PSD







4. Occupied Channel Bandwidth

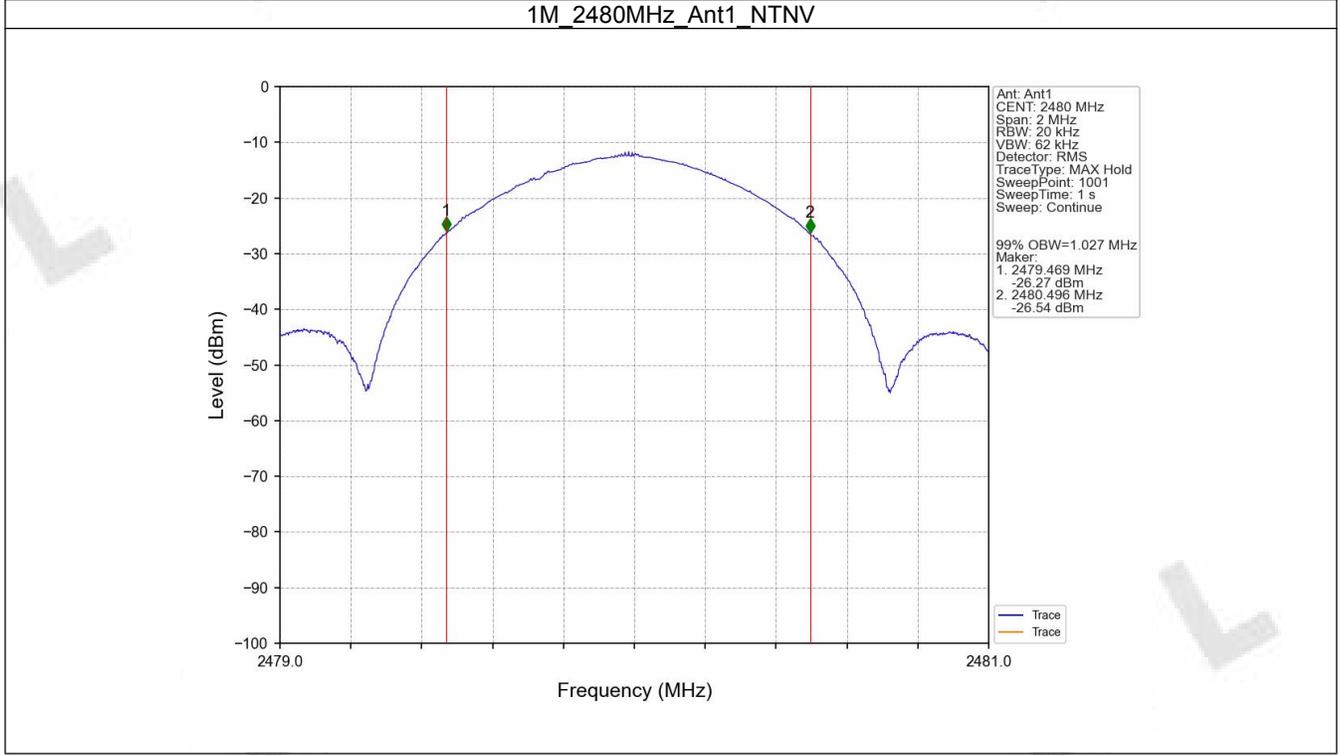
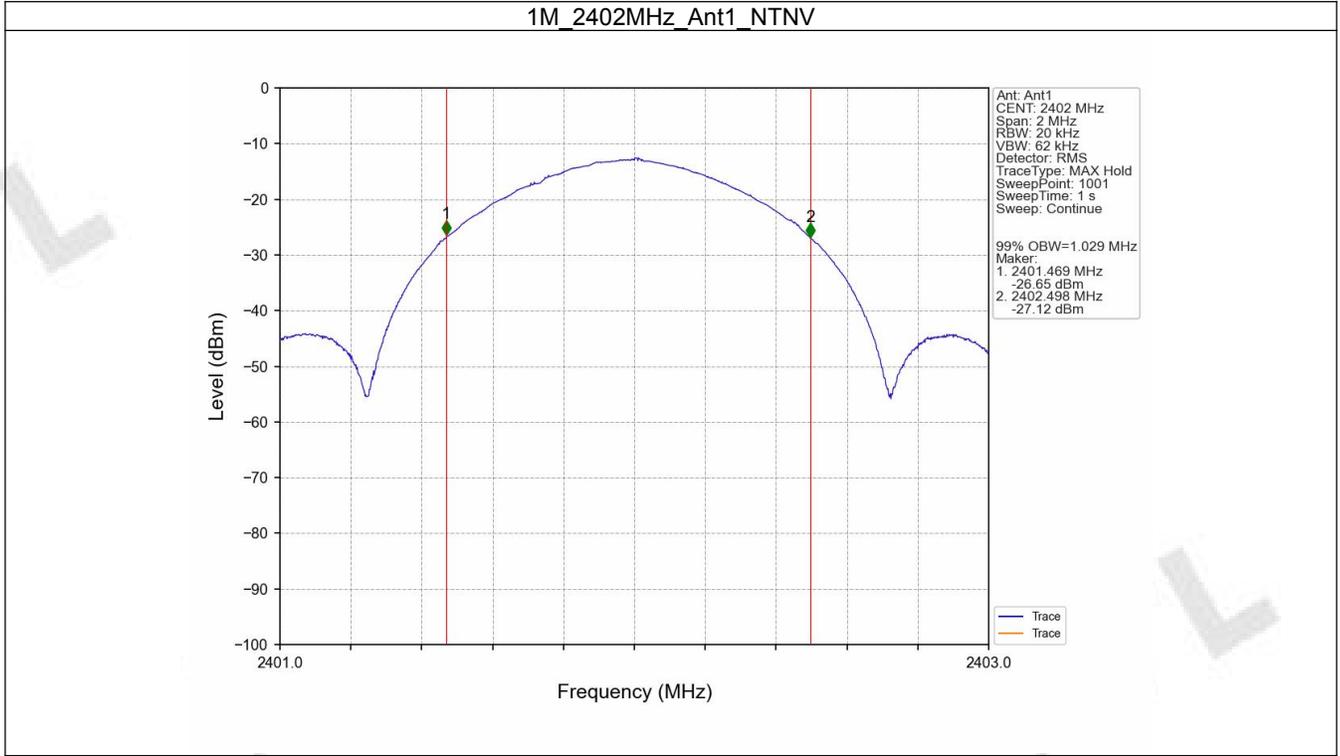
4.1 Test Result

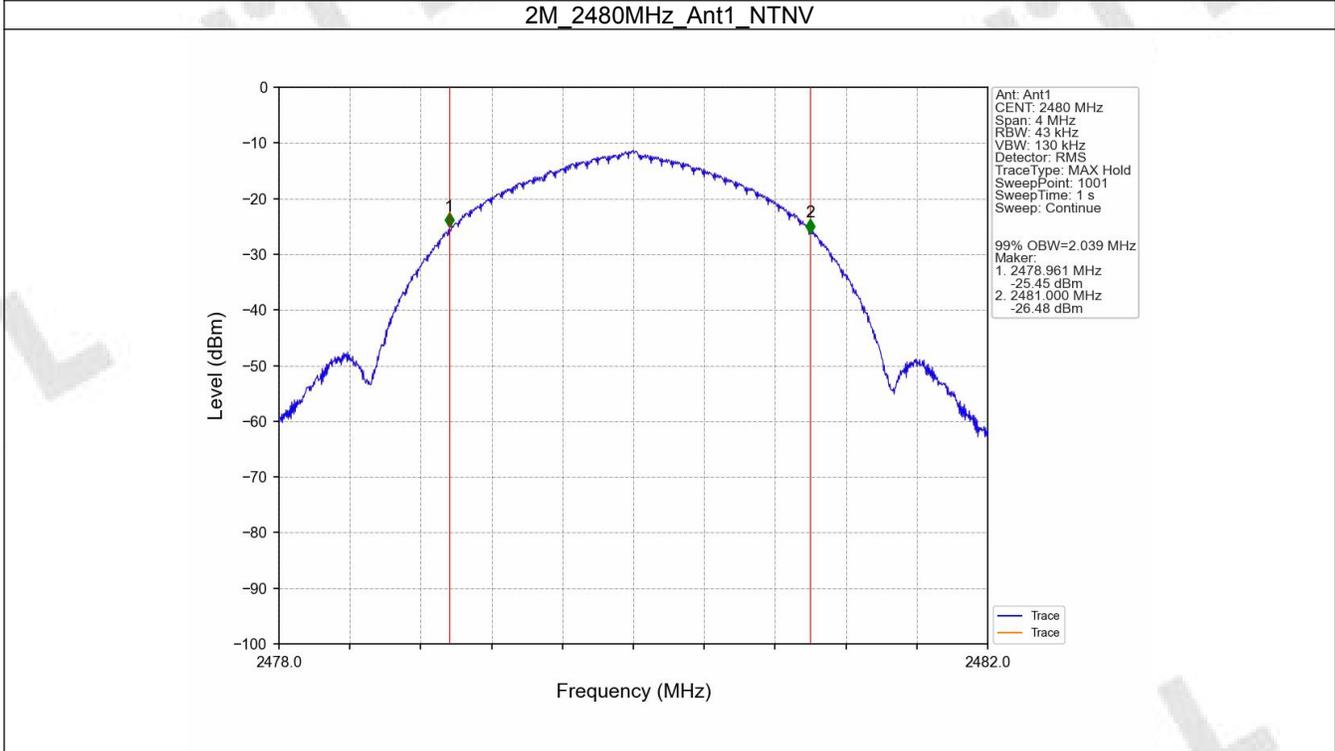
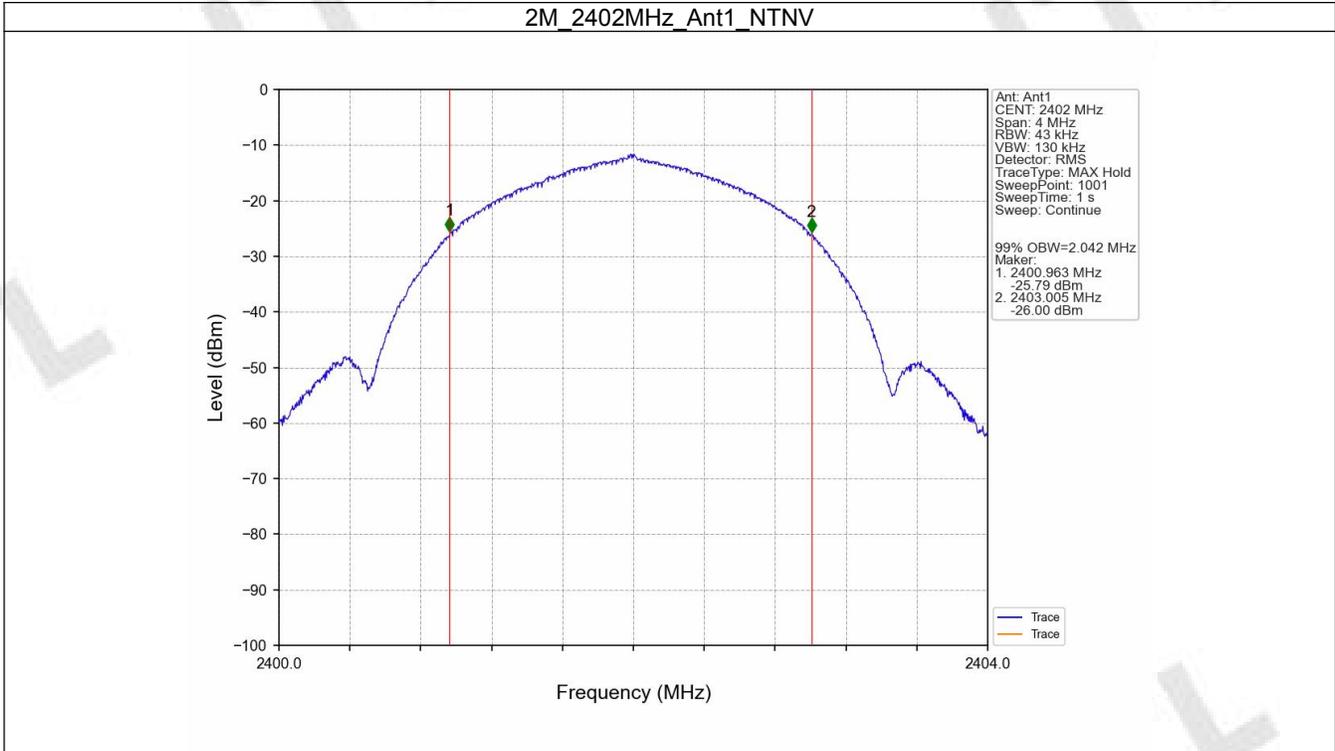
4.1.1 OBW_Ant1

Ant1								
ENV	Mode	TX Type	Frequency (MHz)	OBW (MHz)	Frequency Range (MHz)			Verdict
				Result	FL	FH	Limit	
NTNV	1M	SISO	2402	1.029	2401.469	/	>=2400	Pass
			2480	1.027	/	2480.496	<=2483.5	Pass
	2M	SISO	2402	2.042	2400.963	/	>=2400	Pass
			2480	2.039	/	2481.000	<=2483.5	Pass

4.2 Test Graph

4.2.1 OBW_Ant1





5. Transmitter Unwanted Emissions In The Out-Of-Band Domain

5.1 Test Result

5.1.1 1M-Ant1_NTNV

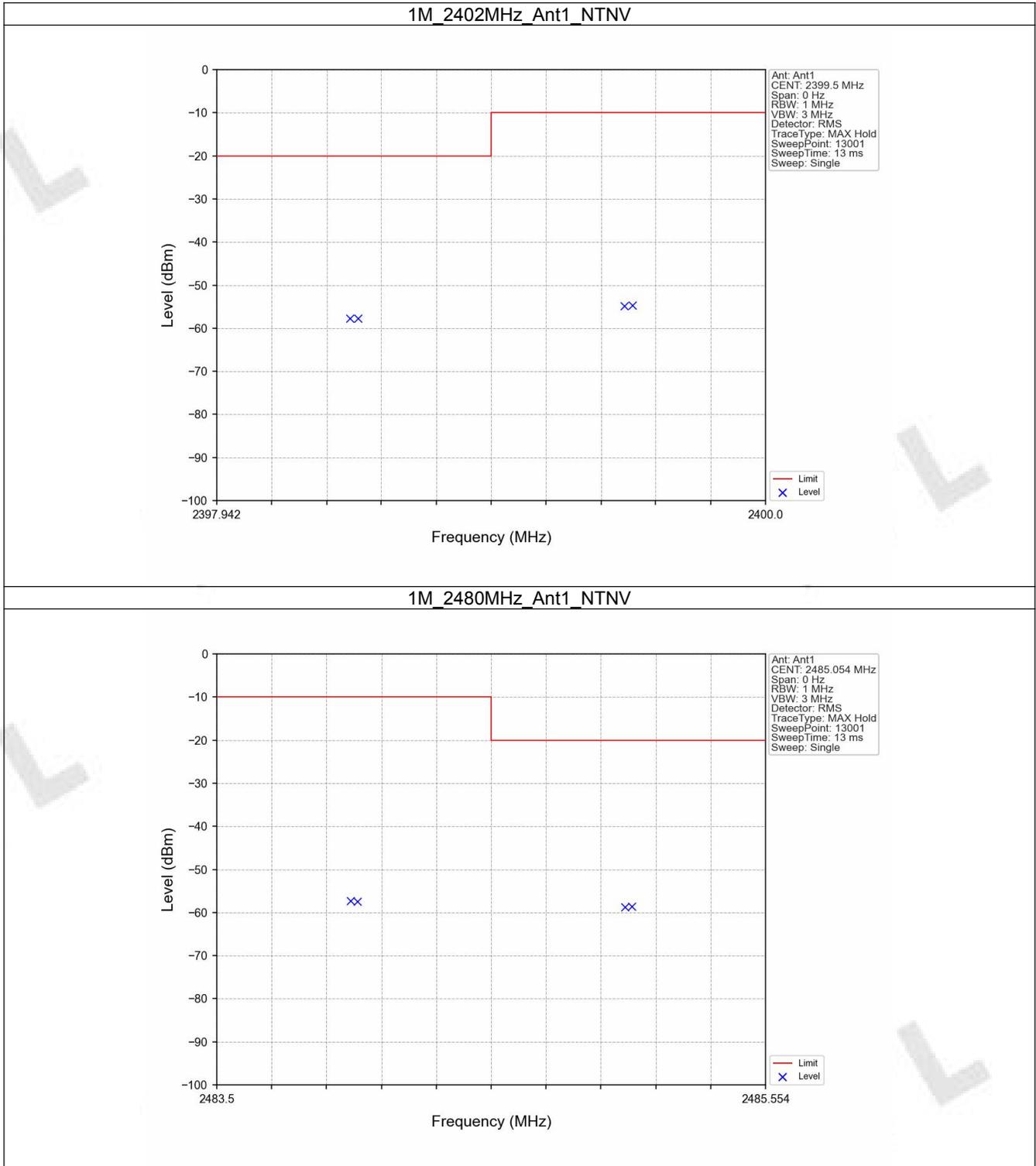
Ant1_NTNV							
Mode	TX Type	Frequency (MHz)	ANT	Test Freq. (MHz)	Result (dBm/MHz)	Limit (dBm/MHz)	Verdict
1M	SISO	2402	1	2398.442	-57.78	<=-20	Pass
				2398.471	-57.75	<=-20	Pass
				2399.471	-54.88	<=-10	Pass
				2399.500	-54.71	<=-10	Pass
		2480	1	2484.000	-57.26	<=-10	Pass
				2484.027	-57.37	<=-10	Pass
				2485.027	-58.67	<=-20	Pass
				2485.054	-58.60	<=-20	Pass

5.1.2 2M-Ant1_NTNV

Ant1_NTNV							
Mode	TX Type	Frequency (MHz)	ANT	Test Freq. (MHz)	Result (dBm/MHz)	Limit (dBm/MHz)	Verdict
2M	SISO	2402	1	2396.416	-61.99	<=-20	Pass
				2396.458	-62.03	<=-20	Pass
				2397.458	-60.49	<=-20	Pass
				2398.458	-58.91	<=-10	Pass
				2398.500	-58.46	<=-10	Pass
				2399.500	-42.10	<=-10	Pass
		2480	1	2484.000	-58.19	<=-10	Pass
				2485.000	-59.60	<=-10	Pass
				2485.039	-59.92	<=-10	Pass
				2486.039	-60.99	<=-20	Pass
				2487.039	-61.87	<=-20	Pass
				2487.078	-61.87	<=-20	Pass

5.2 Test Graph

5.2.1 1M-Ant1_NTNV



5.2.2 2M-Ant1_NTNV

