



## Appendix for Bluetooth BLE Mode

Product Name: Pallet tag  
Model No: PLT005

# WALTEK



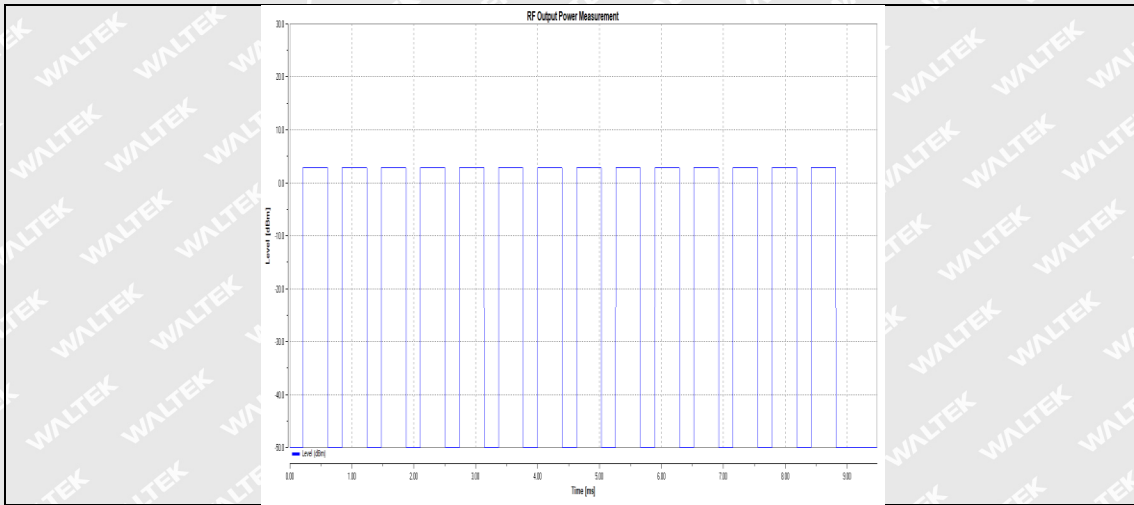
## Appendix A: RF Output Power

### Test Result

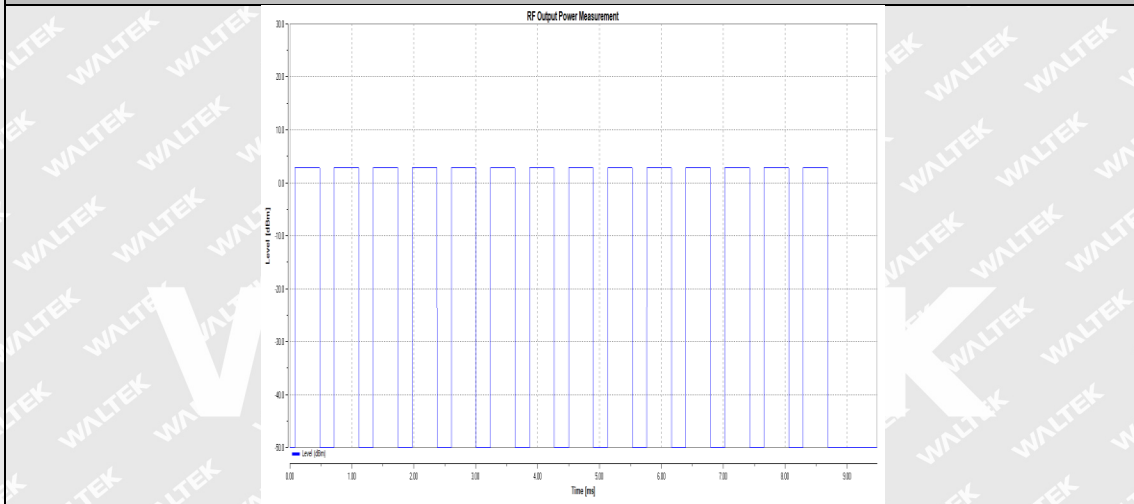
Test Condition	Test Mode	Antenna	Frequency[MHz]	EIRP [dBm]	EIRP Limit [dBm]	Verdict
LTVN	BLE_1M	Ant1	2402	6.41	20	PASS
NTNV	BLE_1M	Ant1	2402	6.41	20	PASS
HTNV	BLE_1M	Ant1	2402	6.42	20	PASS
LTVN	BLE_1M	Ant1	2440	7.06	20	PASS
NTNV	BLE_1M	Ant1	2440	7.04	20	PASS
HTNV	BLE_1M	Ant1	2440	7.05	20	PASS
LTVN	BLE_1M	Ant1	2480	7.49	20	PASS
NTNV	BLE_1M	Ant1	2480	7.48	20	PASS
HTNV	BLE_1M	Ant1	2480	7.48	20	PASS
LTVN	BLE_2M	Ant1	2402	6.38	20	PASS
NTNV	BLE_2M	Ant1	2402	6.39	20	PASS
HTNV	BLE_2M	Ant1	2402	6.38	20	PASS
LTVN	BLE_2M	Ant1	2440	7.02	20	PASS
NTNV	BLE_2M	Ant1	2440	7.02	20	PASS
HTNV	BLE_2M	Ant1	2440	7.02	20	PASS
LTVN	BLE_2M	Ant1	2480	7.47	20	PASS
NTNV	BLE_2M	Ant1	2480	7.48	20	PASS
HTNV	BLE_2M	Ant1	2480	7.48	20	PASS



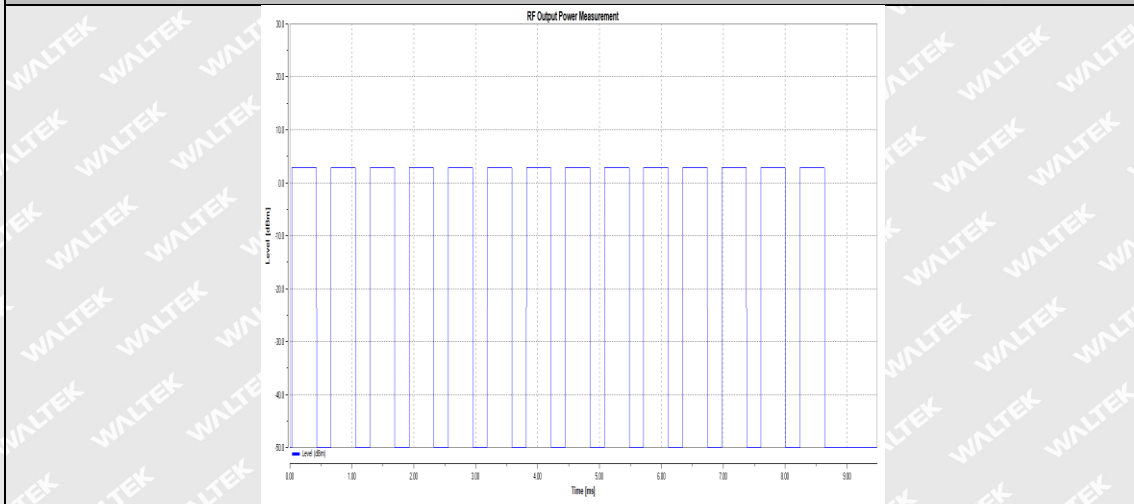
### Test Graphs



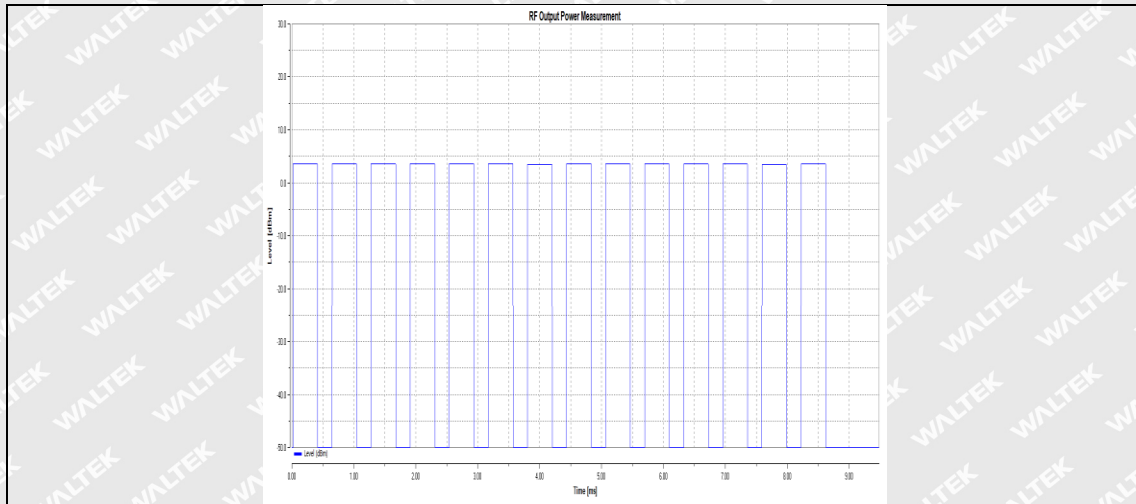
LTNV-BLE\_1M-Ant1-2402-PASS



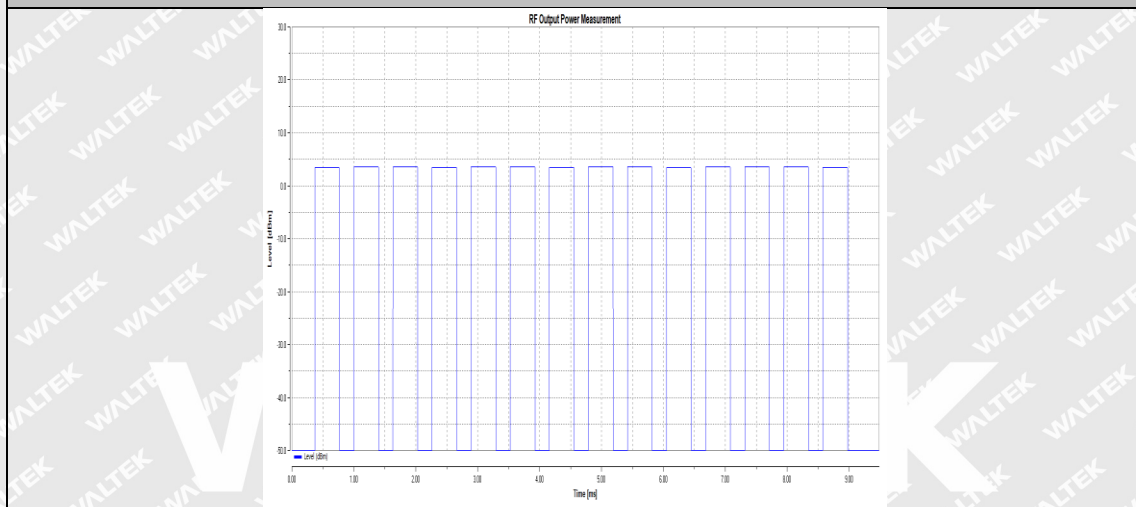
NTNV-BLE\_1M-Ant1-2402-PASS



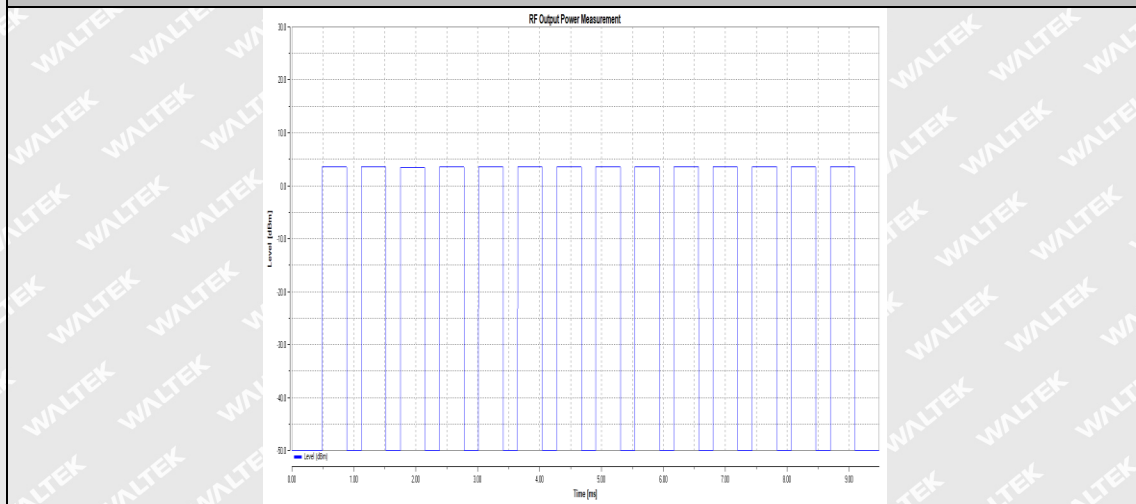
HTNV-BLE\_1M-Ant1-2402-PASS



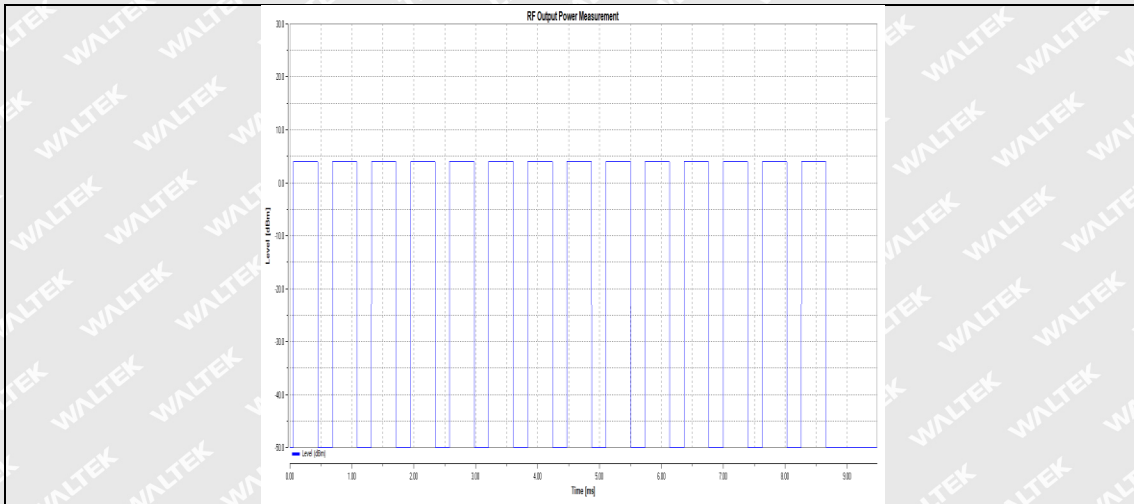
LTNV-BLE\_1M-Ant1-2440-PASS



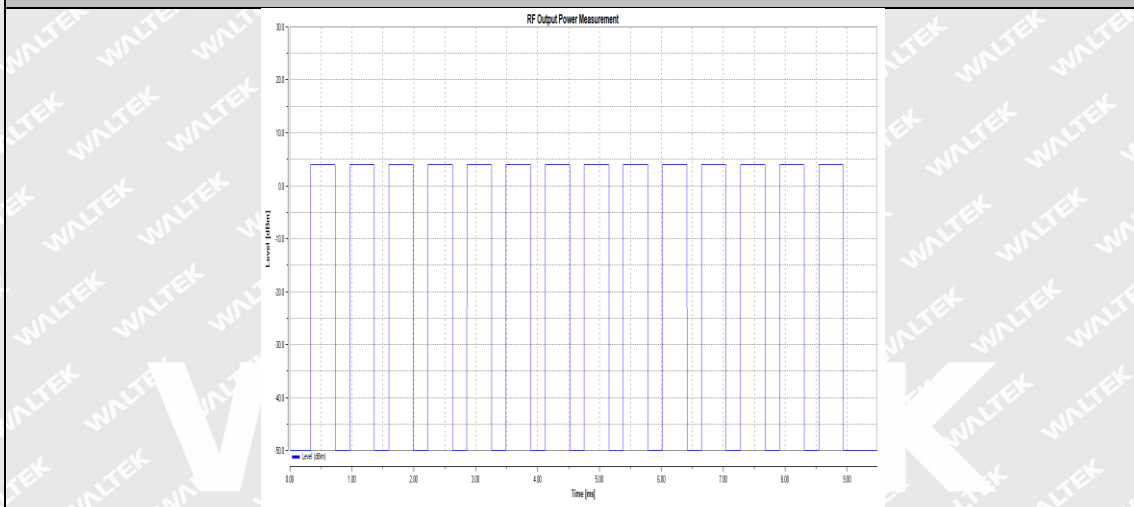
NTNV-BLE\_1M-Ant1-2440-PASS



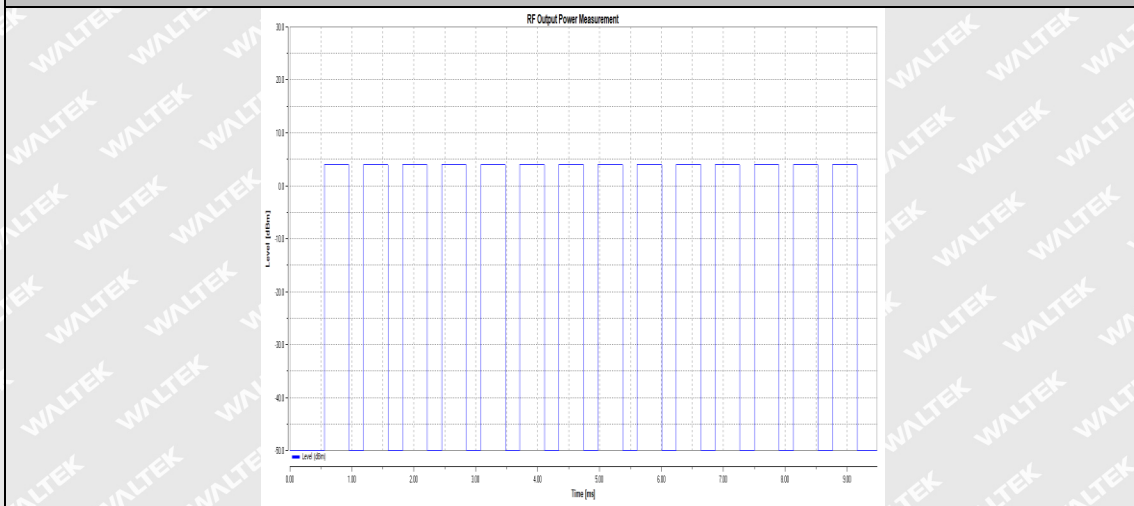
HTNV-BLE\_1M-Ant1-2440-PASS



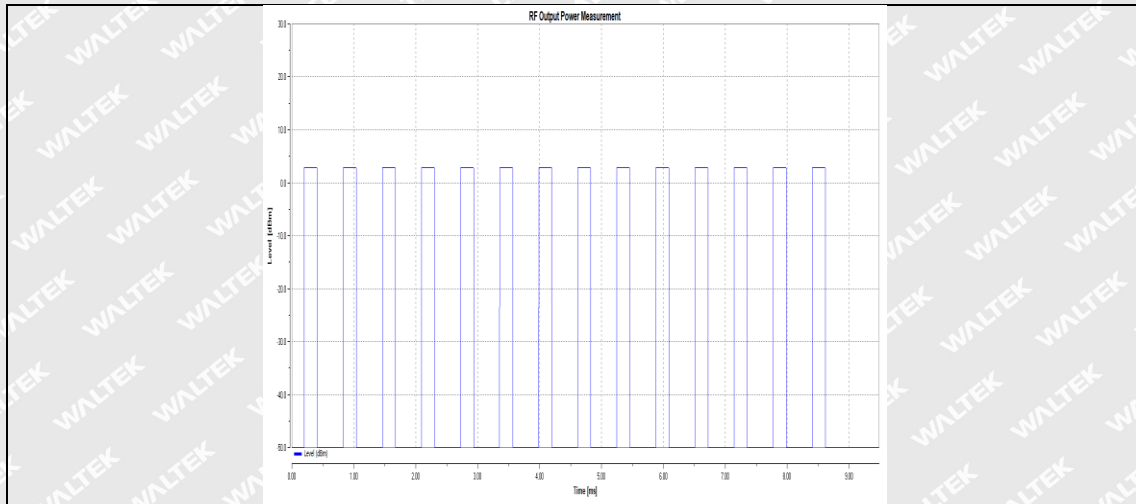
LTNV-BLE\_1M-Ant1-2480-PASS



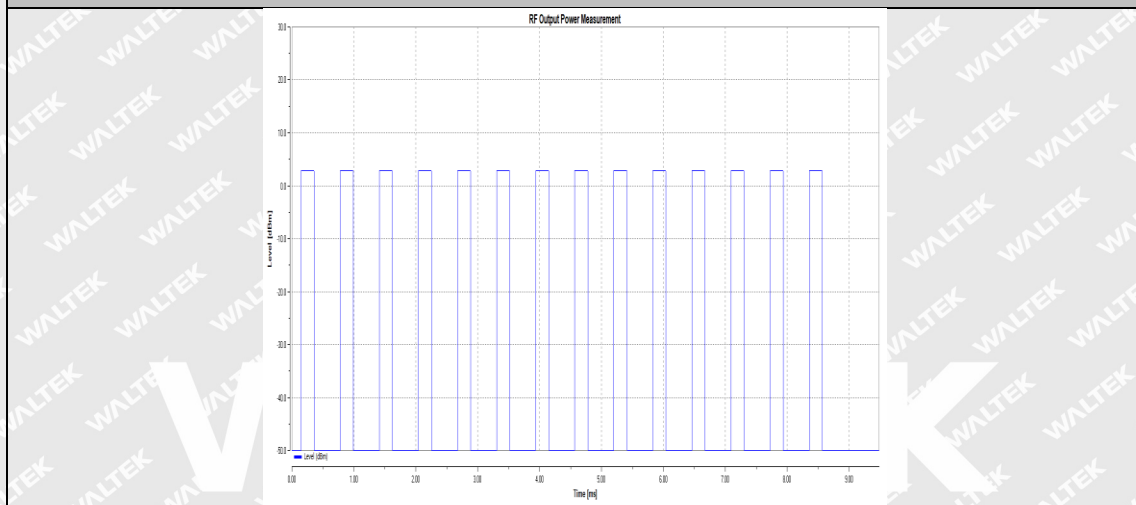
NTNV-BLE\_1M-Ant1-2480-PASS



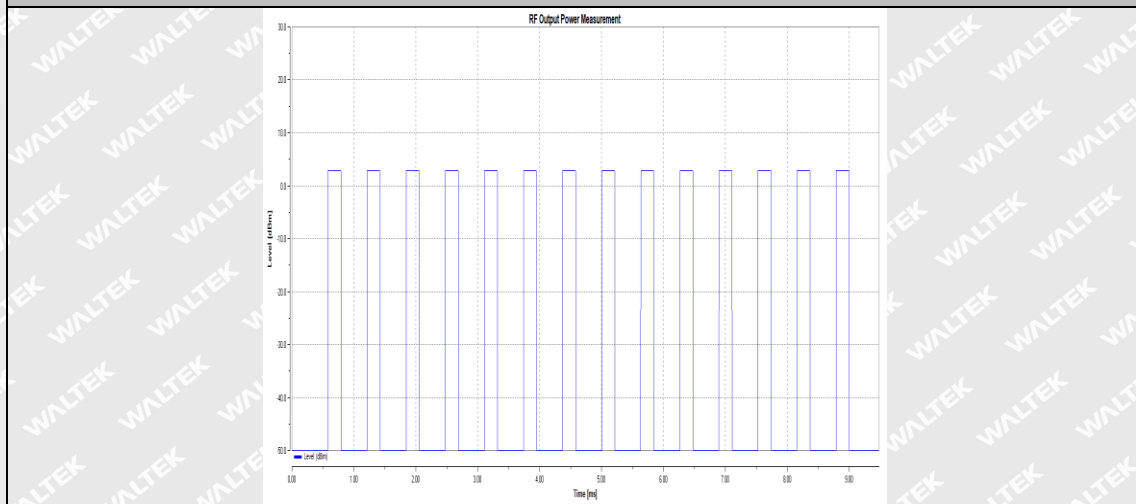
HTNV-BLE\_1M-Ant1-2480-PASS



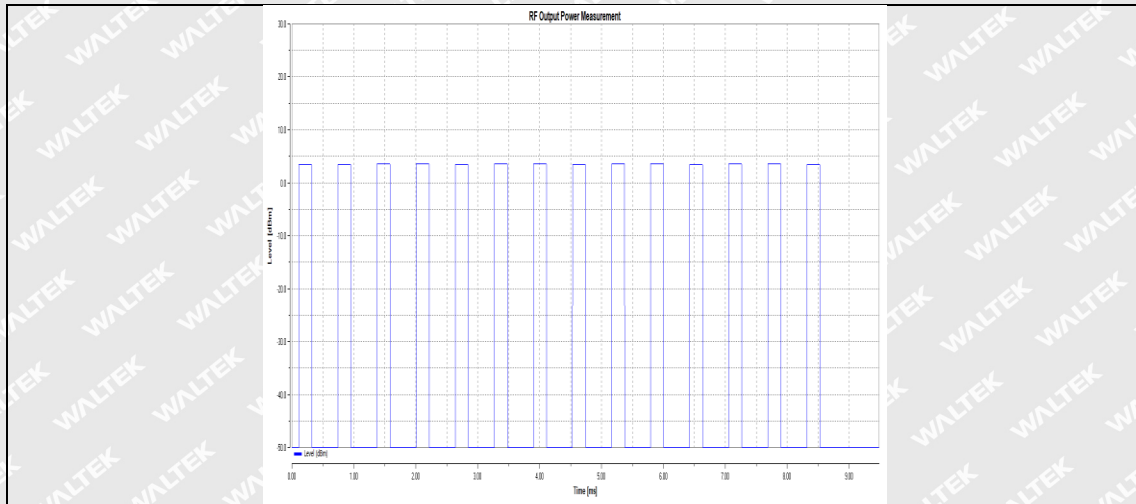
LTNV-BLE\_2M-Ant1-2402-PASS



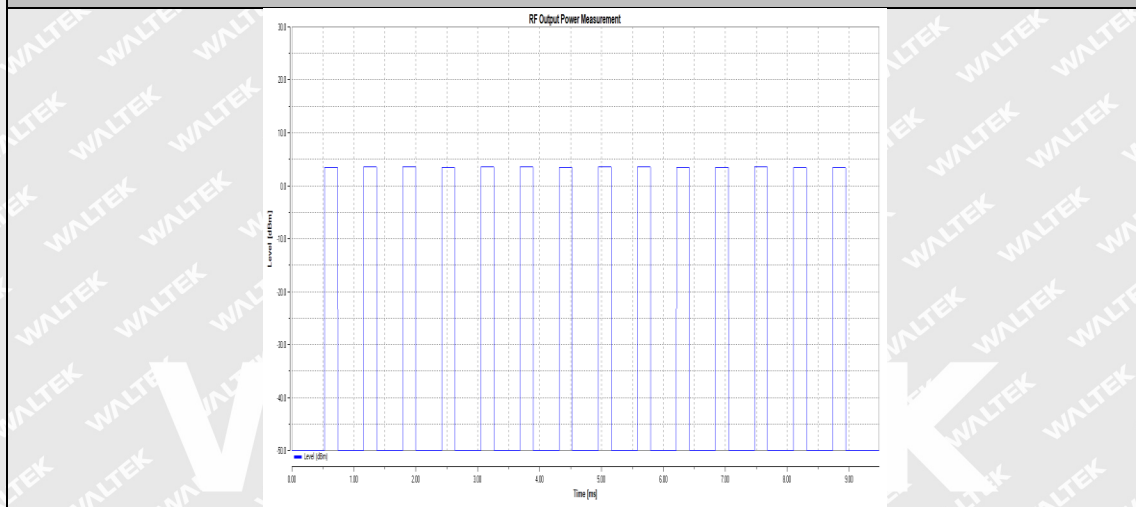
NTNV-BLE\_2M-Ant1-2402-PASS



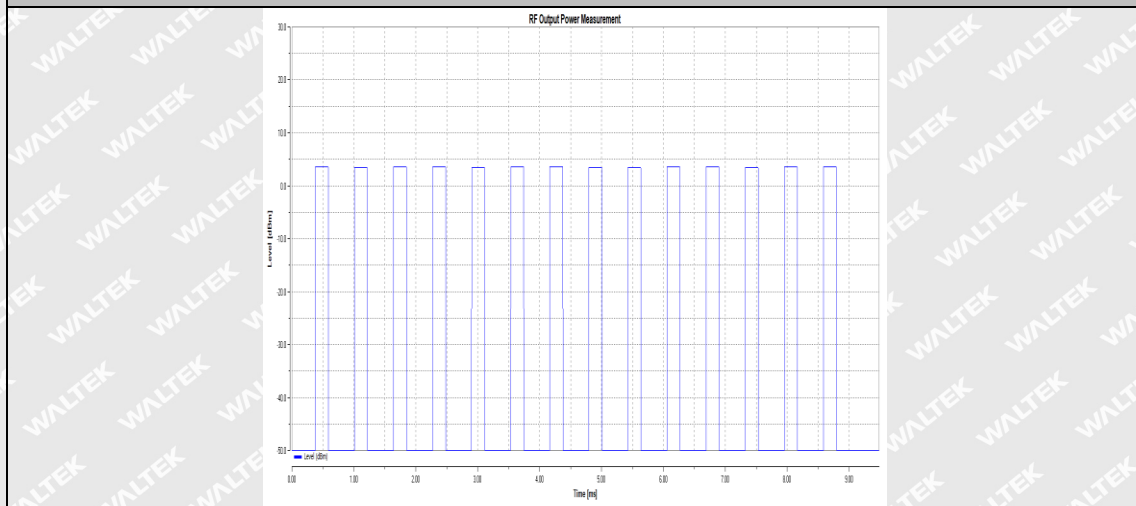
HTNV-BLE\_2M-Ant1-2402-PASS



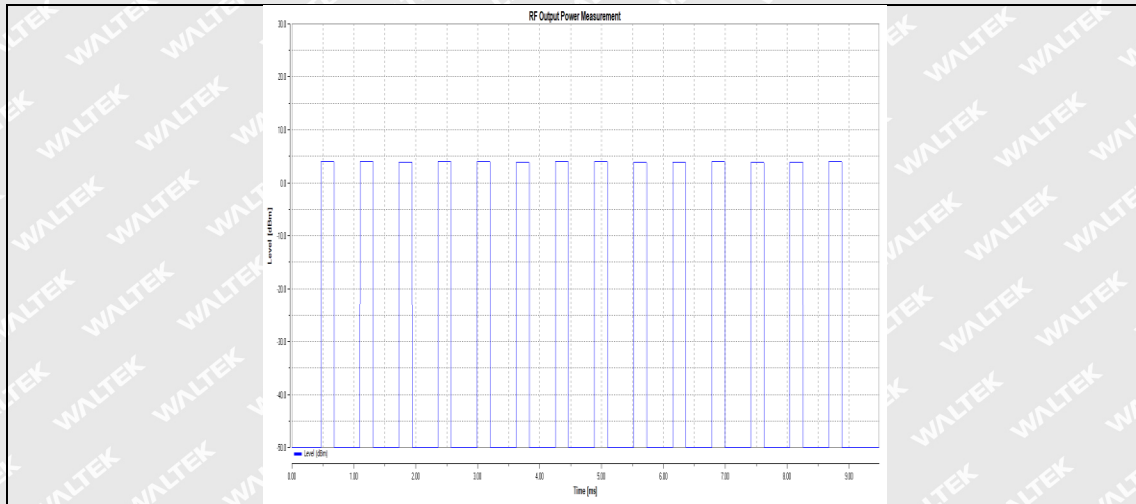
LTNV-BLE\_2M-Ant1-2440-PASS



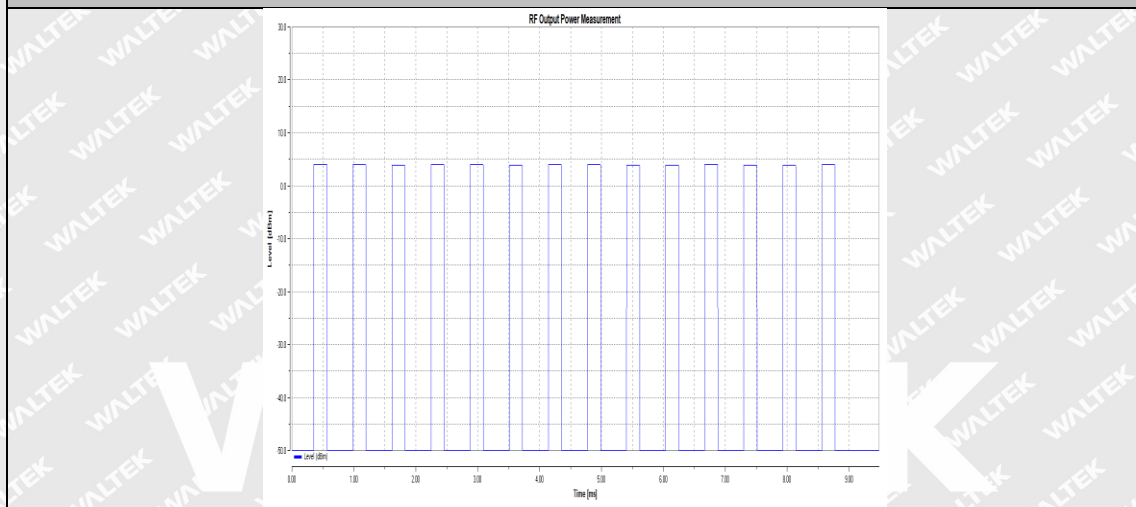
NTNV-BLE\_2M-Ant1-2440-PASS



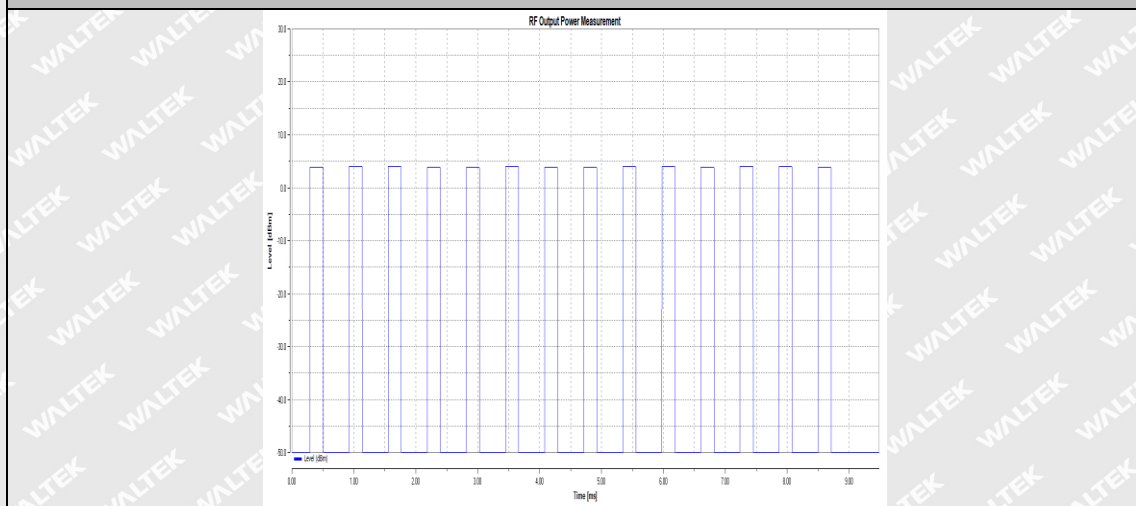
HTNV-BLE\_2M-Ant1-2440-PASS



LTNV-BLE\_2M-Ant1-2480-PASS



NTNV-BLE\_2M-Ant1-2480-PASS



HTNV-BLE\_2M-Ant1-2480-PASS





## Appendix B: Power Spectral Density

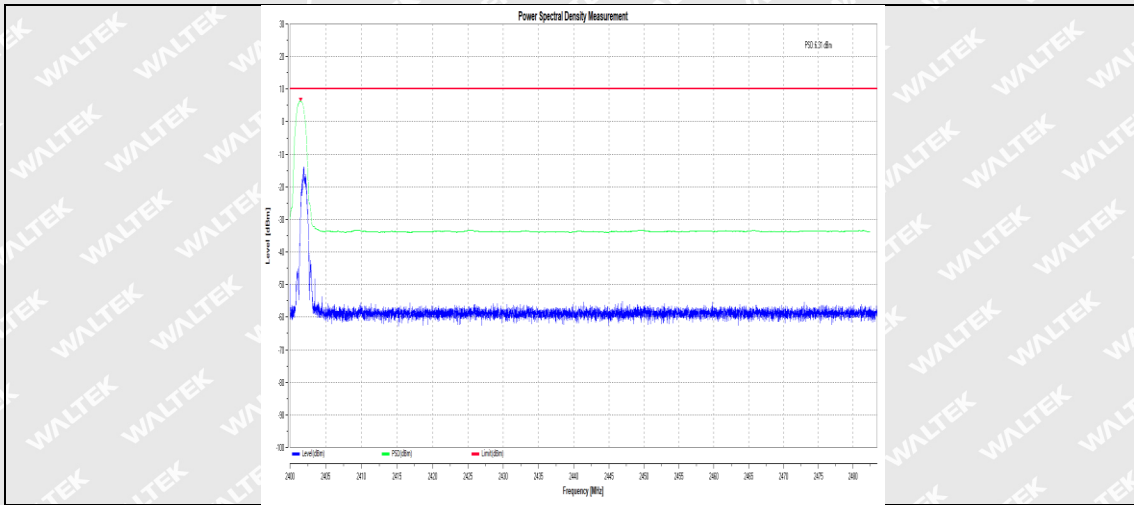
### Test Result

TestMode	Antenna	Frequency[MHz]	EIRP PSD[dBm/MHz]	Limit[dBm/MHz]	Verdict
BLE_1M	Ant1	2402	6.31	10	PASS
BLE_1M	Ant1	2440	6.94	10	PASS
BLE_1M	Ant1	2480	7.37	10	PASS
BLE_2M	Ant1	2402	5.32	10	PASS
BLE_2M	Ant1	2440	5.95	10	PASS
BLE_2M	Ant1	2480	6.38	10	PASS

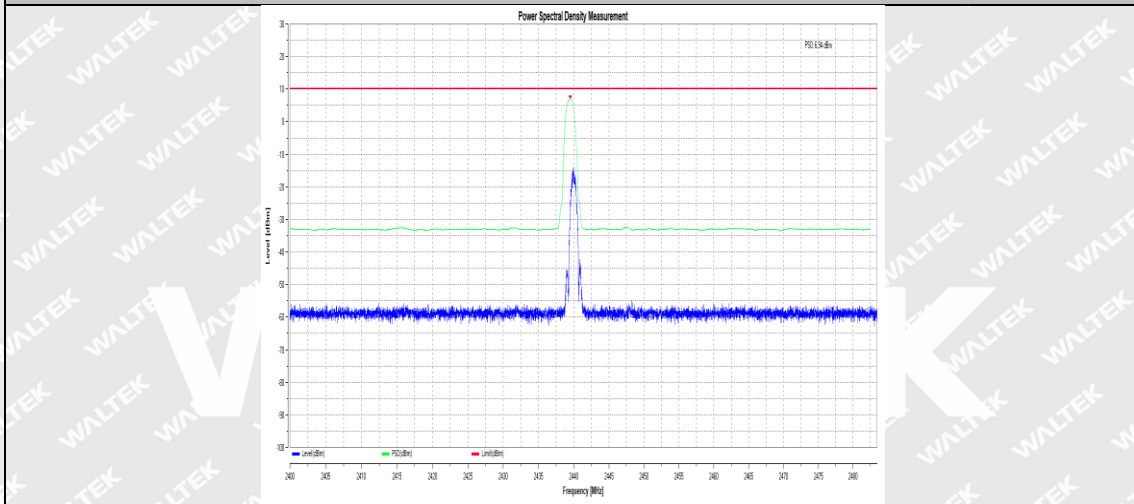
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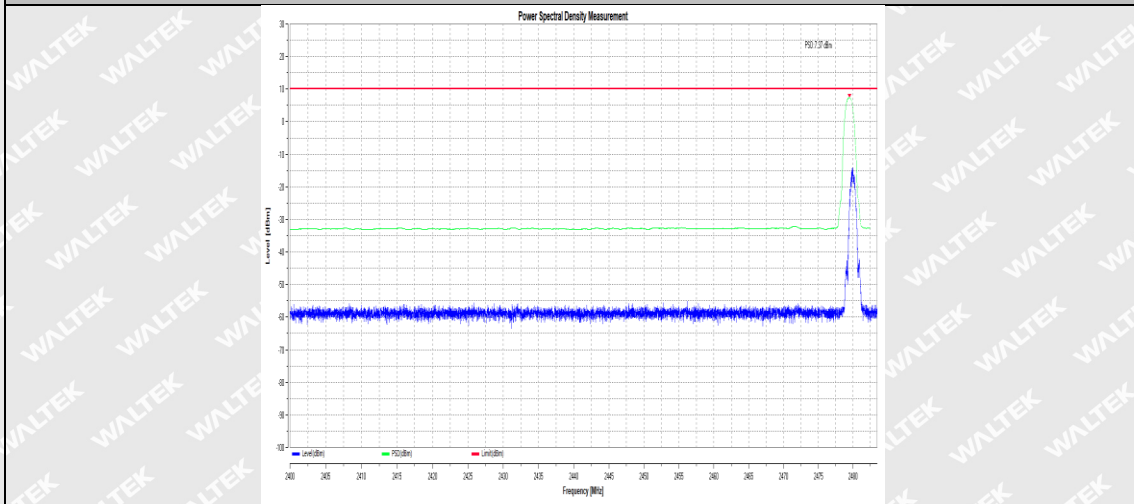
### Test Graphs



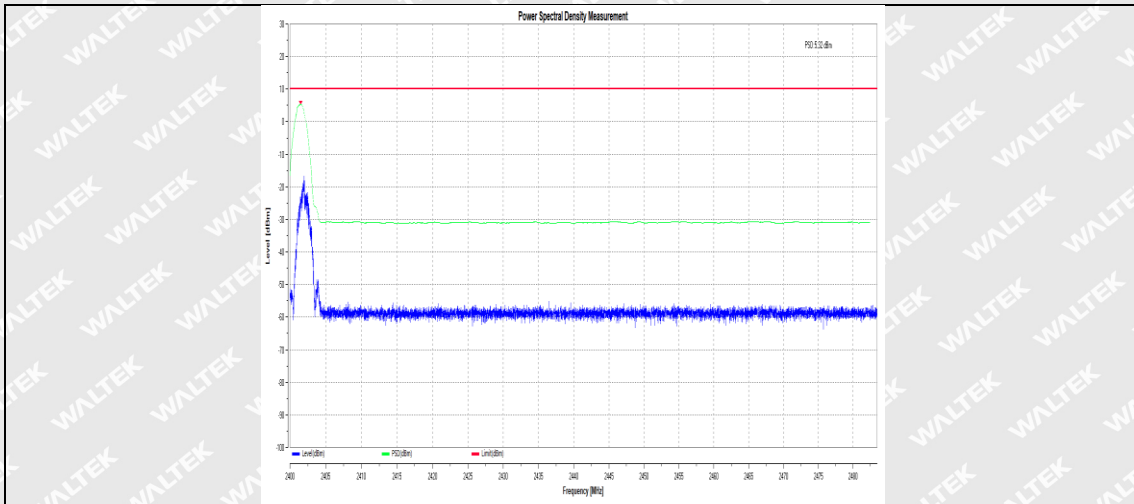
BLE\_1M-Ant1-2402-PASS



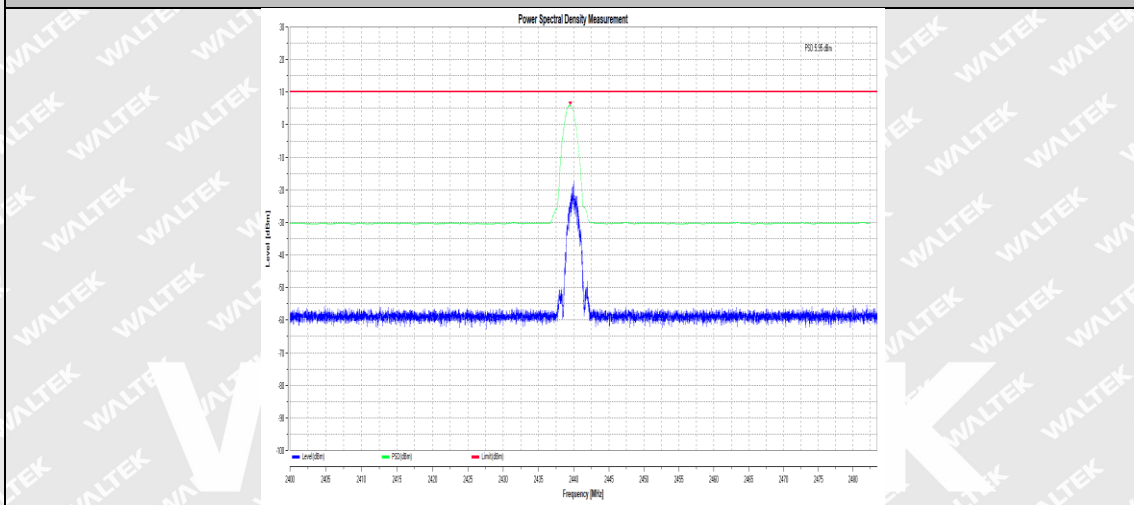
BLE\_1M-Ant1-2440-PASS



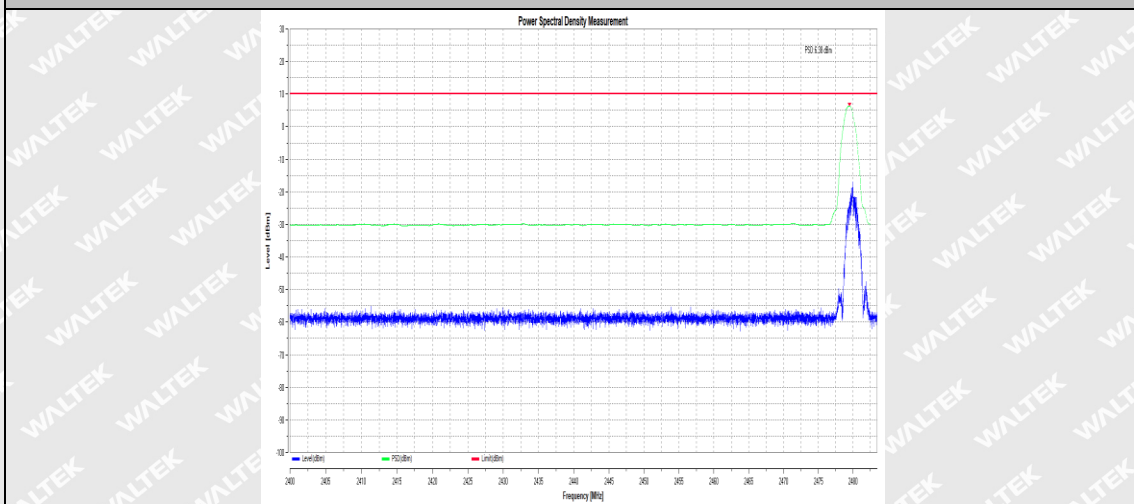
BLE\_1M-Ant1-2480-PASS



BLE\_2M-Ant1-2402-PASS



BLE\_2M-Ant1-2440-PASS



BLE\_2M-Ant1-2480-PASS



## Appendix C: Occupied Channel Bandwidth

### Test Result

TestMode	Antenna	Frequency [MHz]	OCB[MHz]	FL[MHz]	FH[MHz]	Limit [MHz]	Verdict
BLE_1M	Ant1	2402	1.0505	2401.4778	2402.5283	2400 to 2483.5	PASS
BLE_1M	Ant1	2440	1.0534	2439.4753	2440.5287	2400 to 2483.5	PASS
BLE_1M	Ant1	2480	1.0675	2479.4662	2480.5337	2400 to 2483.5	PASS
BLE_2M	Ant1	2402	2.0455	2400.9897	2403.0352	2400 to 2483.5	PASS
BLE_2M	Ant1	2440	2.0478	2438.9878	2441.0356	2400 to 2483.5	PASS
BLE_2M	Ant1	2480	2.0569	2478.9841	2481.0410	2400 to 2483.5	PASS

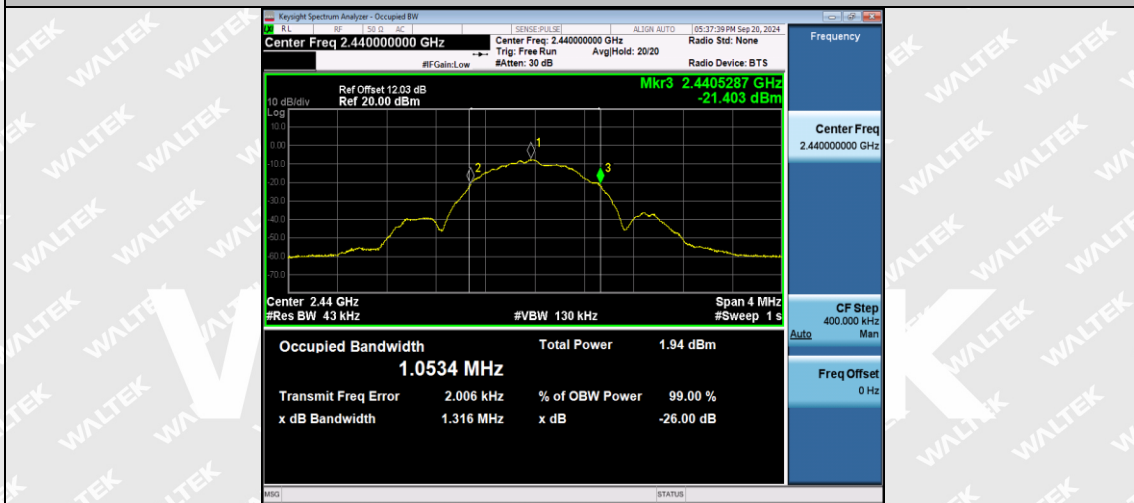
# WALTEK



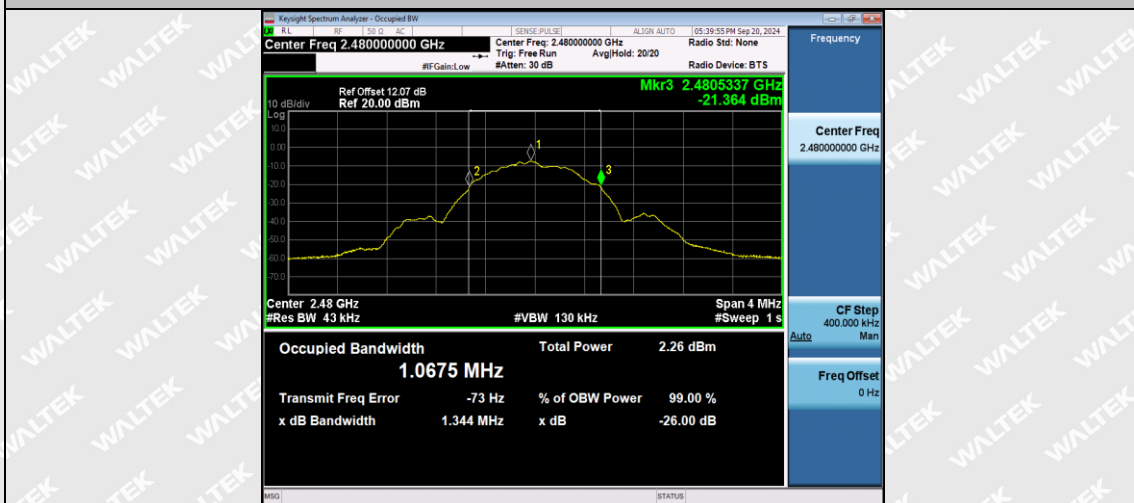
### Test Graphs



BLE\_1M-Ant1-2402-PASS



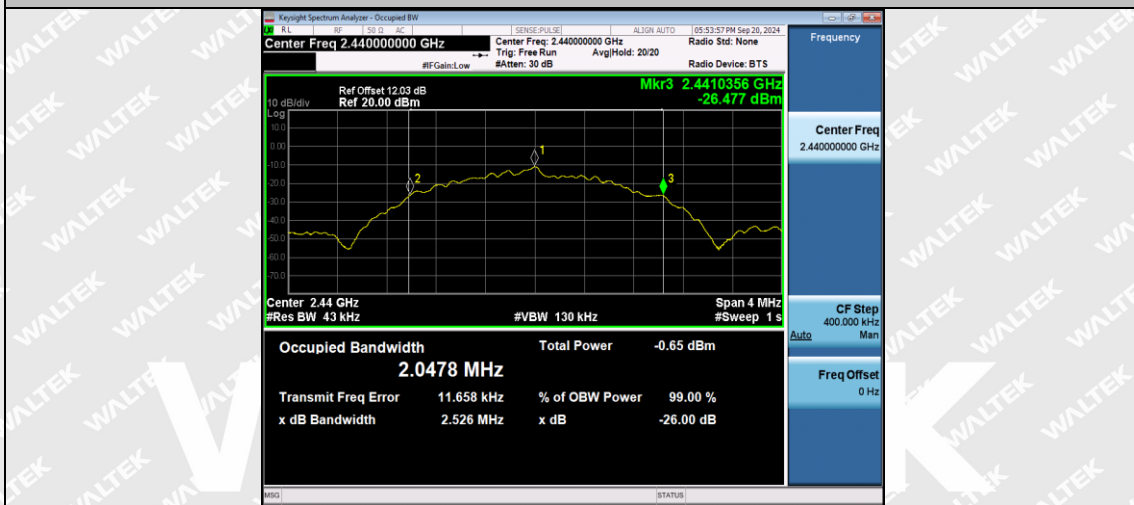
BLE\_1M-Ant1-2440-PASS



BLE\_1M-Ant1-2480-PASS



BLE\_2M-Ant1-2402-PASS



BLE\_2M-Ant1-2440-PASS



BLE\_2M-Ant1-2480-PASS



## Appendix D: Transmitter Unwanted Emissions In The Out-Of-BandDomain

### Test Result

TestMode	Antenna	Frequency[MHz]	Freq. [MHz]	Level[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	2398.399	-49.74	-20.00	PASS
BLE_1M	Ant1	2402	2398.4495	-49.64	-20.00	PASS
BLE_1M	Ant1	2402	2399.4495	-38.46	-10.00	PASS
BLE_1M	Ant1	2402	2399.5	-37.11	-10.00	PASS
BLE_1M	Ant1	2402	2484	-43.66	-10.00	PASS
BLE_1M	Ant1	2402	2484.0505	-43.63	-10.00	PASS
BLE_1M	Ant1	2402	2485.0505	-45.85	-20.00	PASS
BLE_1M	Ant1	2402	2485.101	-45.98	-20.00	PASS
BLE_1M	Ant1	2480	2398.365	-44.66	-20.00	PASS
BLE_1M	Ant1	2480	2398.4325	-44.67	-20.00	PASS
BLE_1M	Ant1	2480	2399.4325	-41.22	-10.00	PASS
BLE_1M	Ant1	2480	2399.5	-40.83	-10.00	PASS
BLE_1M	Ant1	2480	2484	-49.74	-10.00	PASS
BLE_1M	Ant1	2480	2484.0675	-49.84	-10.00	PASS
BLE_1M	Ant1	2480	2485.0675	-50.71	-20.00	PASS
BLE_1M	Ant1	2480	2485.135	-50.77	-20.00	PASS
BLE_2M	Ant1	2402	2396.409	-49.32	-20.00	PASS
BLE_2M	Ant1	2402	2396.4545	-49.27	-20.00	PASS
BLE_2M	Ant1	2402	2397.4545	-47.98	-20.00	PASS
BLE_2M	Ant1	2402	2398.4545	-46.45	-10.00	PASS
BLE_2M	Ant1	2402	2398.5	-46.25	-10.00	PASS
BLE_2M	Ant1	2402	2399.5	-28.13	-10.00	PASS
BLE_2M	Ant1	2402	2484	-44.66	-10.00	PASS
BLE_2M	Ant1	2402	2485	-45.96	-10.00	PASS
BLE_2M	Ant1	2402	2485.0455	-46.06	-10.00	PASS
BLE_2M	Ant1	2402	2486.0455	-47.55	-20.00	PASS
BLE_2M	Ant1	2402	2487.0455	-46.93	-20.00	PASS
BLE_2M	Ant1	2402	2487.091	-46.88	-20.00	PASS
BLE_2M	Ant1	2480	2396.3862	-47.55	-20.00	PASS
BLE_2M	Ant1	2480	2396.4431	-47.49	-20.00	PASS
BLE_2M	Ant1	2480	2397.4431	-45.56	-20.00	PASS
BLE_2M	Ant1	2480	2398.4431	-45.61	-10.00	PASS
BLE_2M	Ant1	2480	2398.5	-45.59	-10.00	PASS
BLE_2M	Ant1	2480	2399.5	-41.39	-10.00	PASS
BLE_2M	Ant1	2480	2484	-46.58	-10.00	PASS

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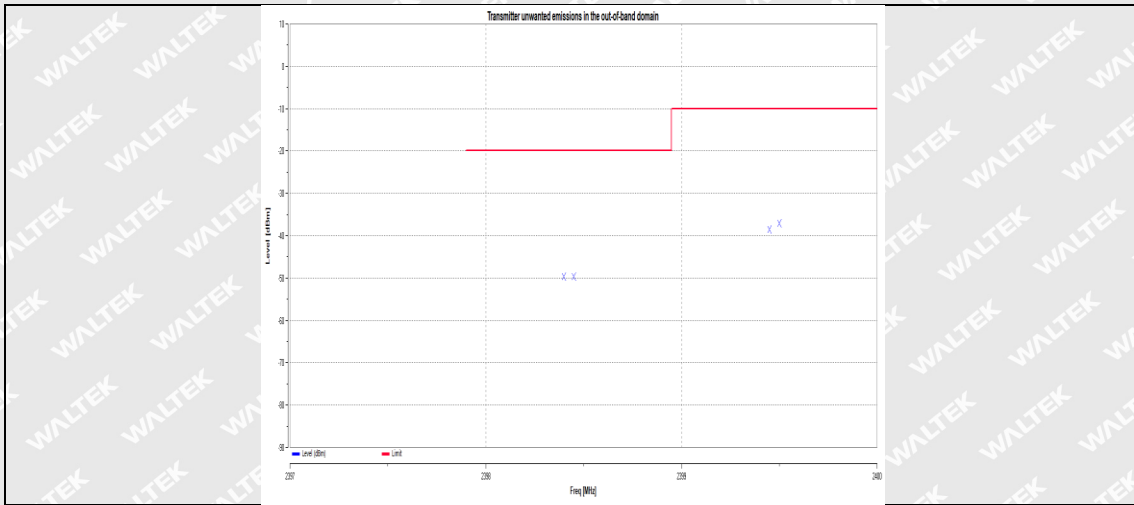
BLE_2M	Ant1	2480	2485	-48.00	-10.00	PASS
BLE_2M	Ant1	2480	2485.0569	-48.11	-10.00	PASS
BLE_2M	Ant1	2480	2486.0569	-48.84	-20.00	PASS
BLE_2M	Ant1	2480	2487.0569	-43.28	-20.00	PASS
BLE_2M	Ant1	2480	2487.1138	-42.66	-20.00	PASS

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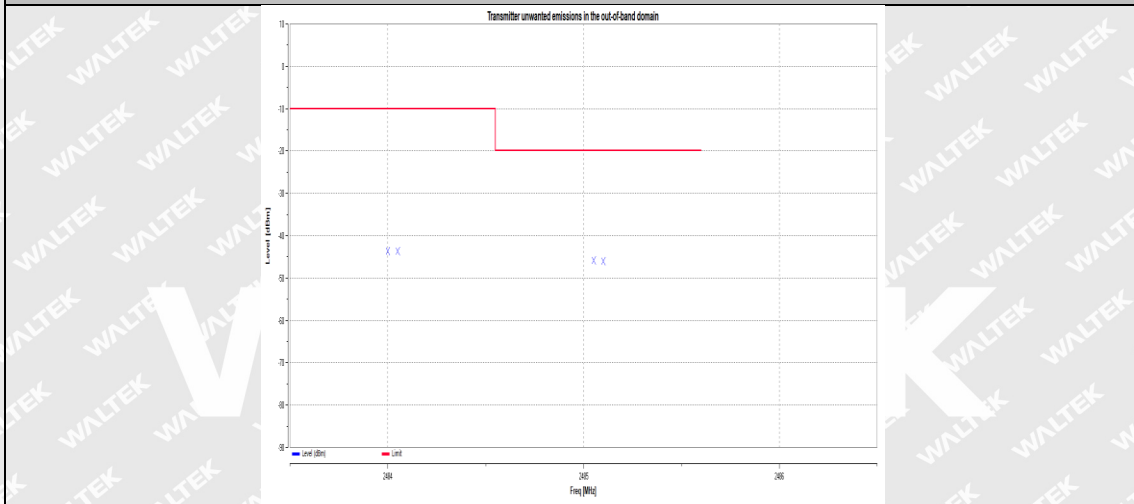




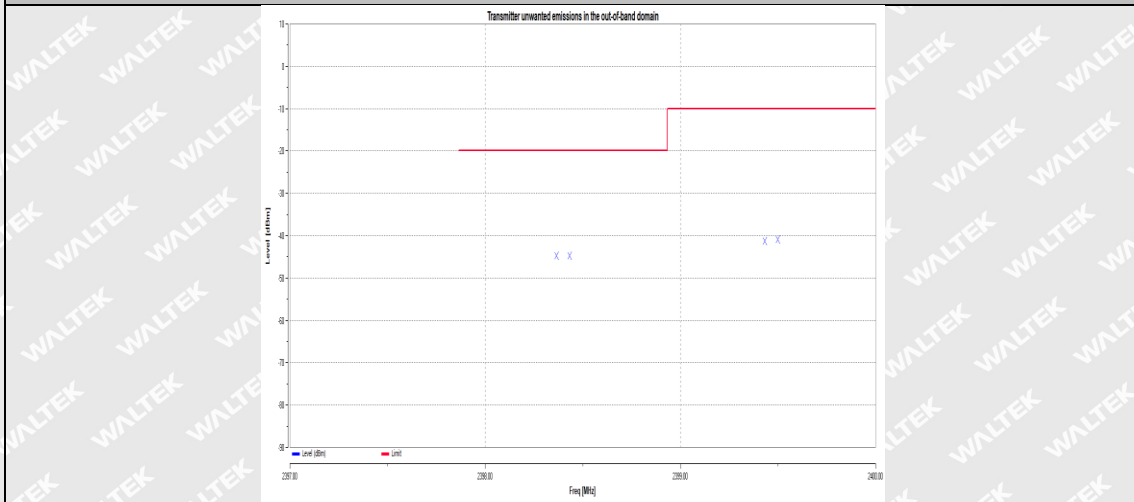
### Test Graphs



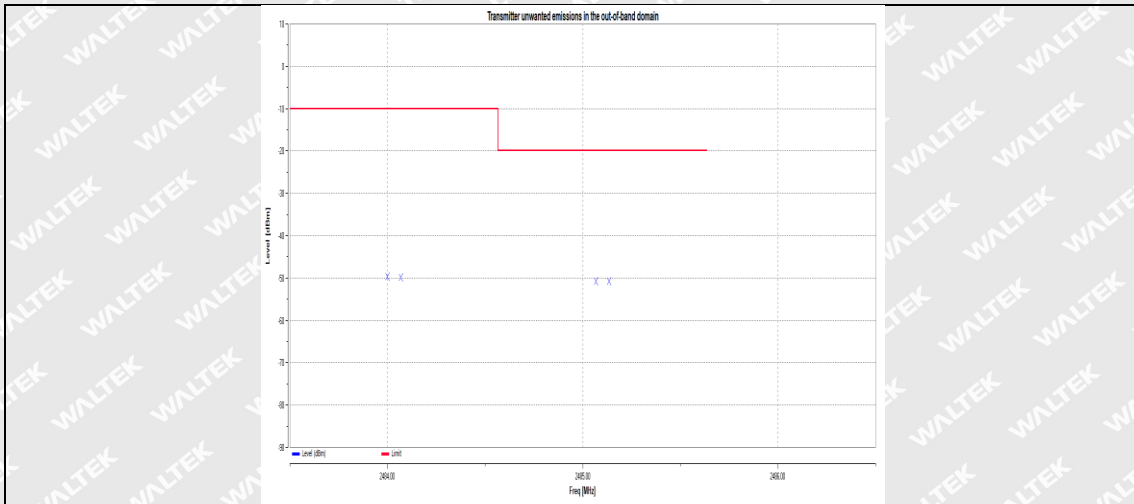
BLE\_1M-Ant1-2402-PASS



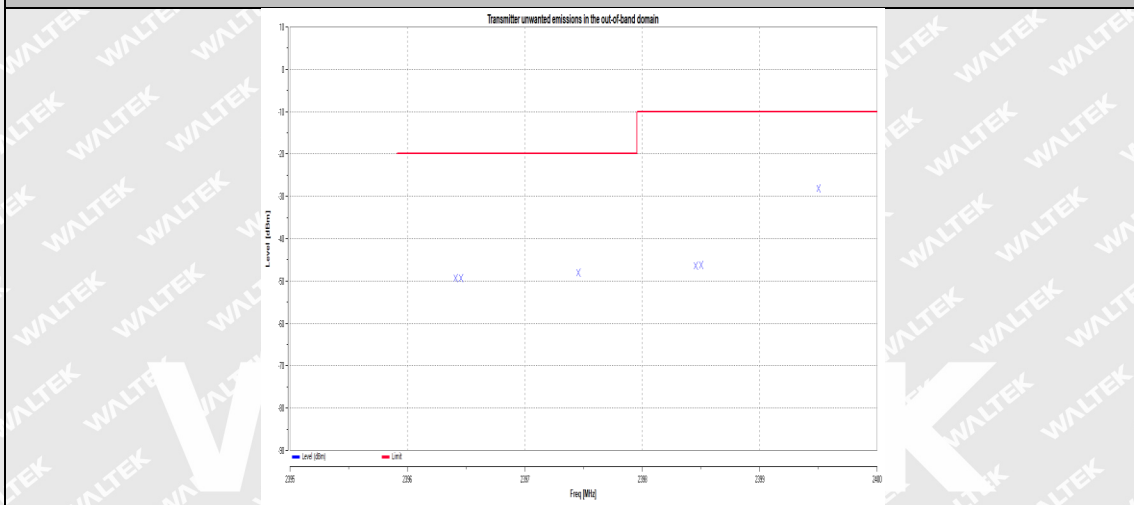
BLE\_1M-Ant1-2402-PASS



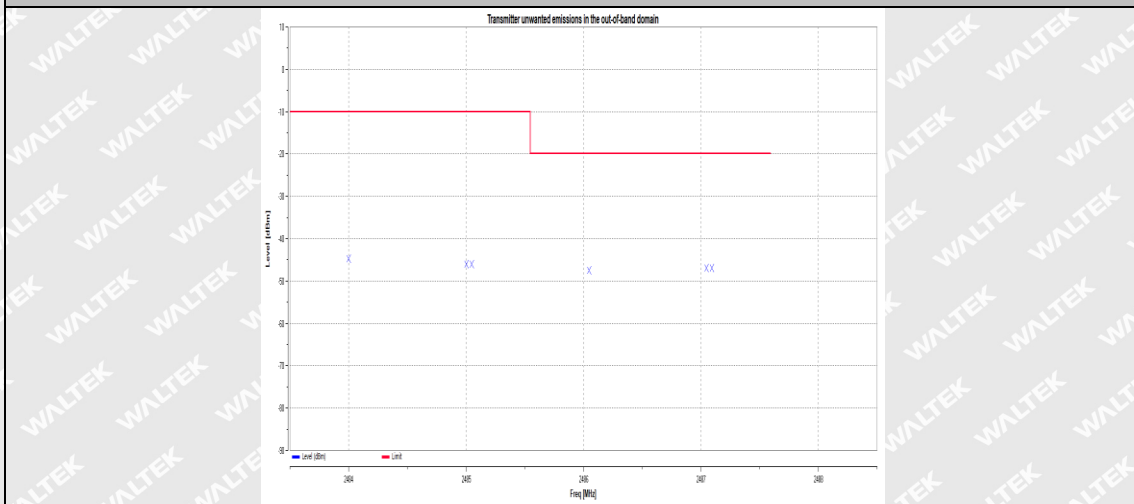
BLE\_1M-Ant1-2480-PASS



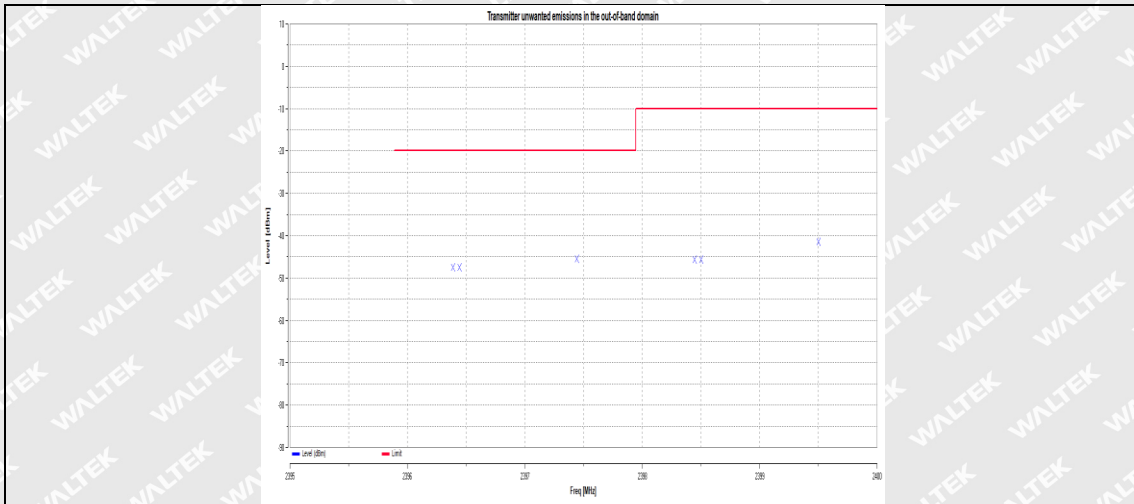
BLE\_1M-Ant1-2480-PASS



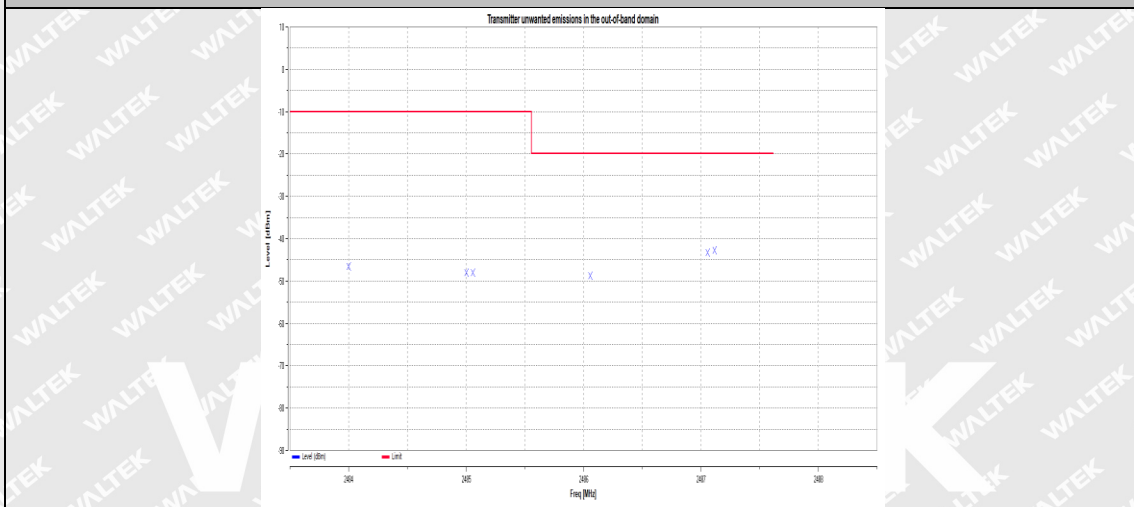
BLE\_2M-Ant1-2402-PASS



BLE\_2M-Ant1-2402-PASS



BLE\_2M-Ant1-2480-PASS



BLE\_2M-Ant1-2480-PASS



## Appendix E: Transmitter unwanted emissions in the spurious domain

### Test Result-Pre-scan

TestMode	Antenna	Frequency[MHz]	Freq. [MHz]	Level[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	200.07	-57.93	-54	See table below
BLE_1M	Ant1	2402	215.92	-58.31	-54	See table below
BLE_1M	Ant1	2402	224.00	-55.15	-54	See table below
BLE_1M	Ant1	2402	2529.67	-36.01	-30	PASS
BLE_1M	Ant1	2402	4804.50	-38.90	-30	PASS
BLE_1M	Ant1	2402	12011.32	-53.49	-30	PASS
BLE_1M	Ant1	2480	200.07	-59.21	-54	See table below
BLE_1M	Ant1	2480	215.92	-58.86	-54	See table below
BLE_1M	Ant1	2480	224.00	-55.79	-54	See table below
BLE_1M	Ant1	2480	2608.00	-35.91	-30	See table below
BLE_1M	Ant1	2480	4959.30	-42.09	-30	PASS
BLE_1M	Ant1	2480	12400.76	-55.12	-30	PASS
BLE_2M	Ant1	2402	104.04	-59.52	-54	See table below
BLE_2M	Ant1	2402	215.92	-56.30	-54	See table below
BLE_2M	Ant1	2402	224.00	-55.40	-54	See table below



BLE_2M	Ant1	2402	2529.33	-36.26	-30	PASS
BLE_2M	Ant1	2402	4804.20	-39.09	-30	PASS
BLE_2M	Ant1	2402	12011.90	-53.07	-30	PASS
BLE_2M	Ant1	2480	215.92	-57.40	-54	See table below
BLE_2M	Ant1	2480	2607.67	-36.38	-30	PASS
BLE_2M	Ant1	2480	4959.00	-42.32	-30	PASS
BLE_2M	Ant1	2480	11454.88	-54.98	-30	PASS

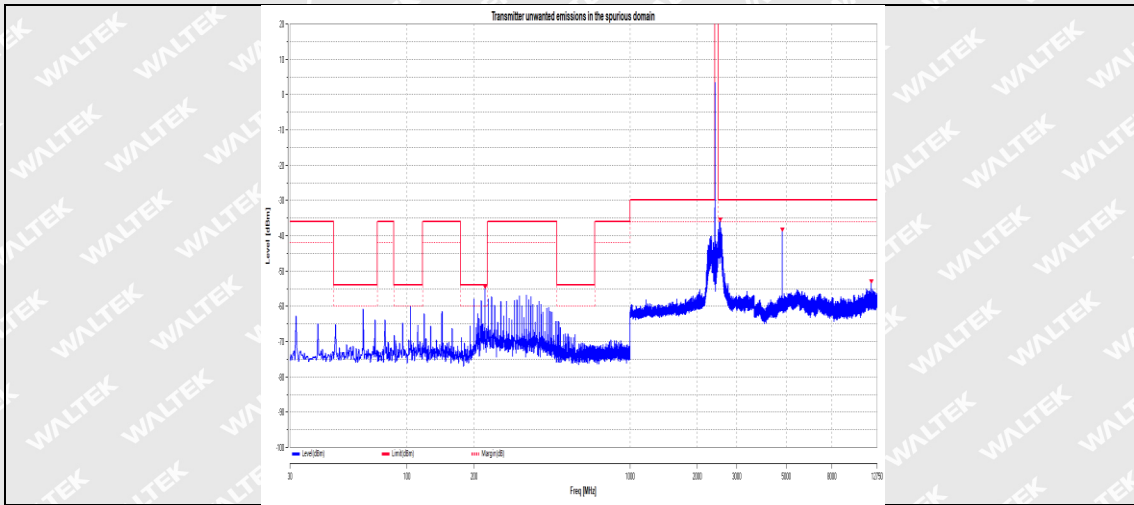
### Test Result- Emissions identified during the pre-scan

**Note:** This test case only applicable the test result fall within the 6 dB range below the limit during the Pre-scan.

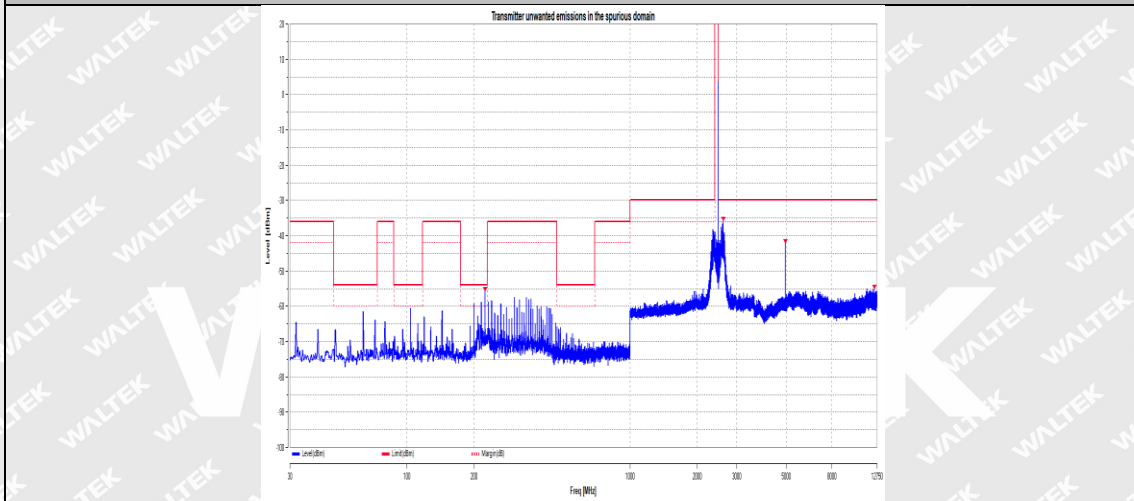
TestMode	Antenna	Frequency[MHz]	Freq. [MHz]	Level[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	199.98	-62.64	-54	PASS
BLE_1M	Ant1	2402	215.99	-59.77	-54	PASS
BLE_1M	Ant1	2402	224.02	-56.55	-54	PASS
BLE_1M	Ant1	2480	199.78	-76.60	-54	PASS
BLE_1M	Ant1	2480	216.03	-62.10	-54	PASS
BLE_1M	Ant1	2480	223.99	-57.13	-54	PASS
BLE_1M	Ant1	2480	2607.99	-45.09	-30	PASS
BLE_2M	Ant1	2402	104.03	-62.14	-54	PASS
BLE_2M	Ant1	2402	216.00	-59.40	-54	PASS
BLE_2M	Ant1	2402	224.00	-56.12	-54	PASS
BLE_2M	Ant1	2480	216.21	-72.61	-54	PASS



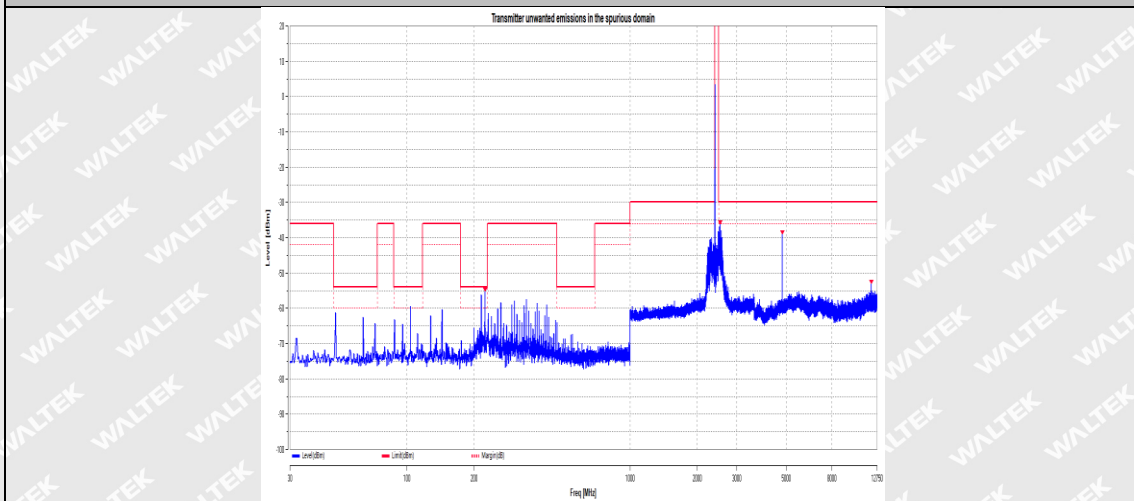
### Test Graphs-Pre-scan



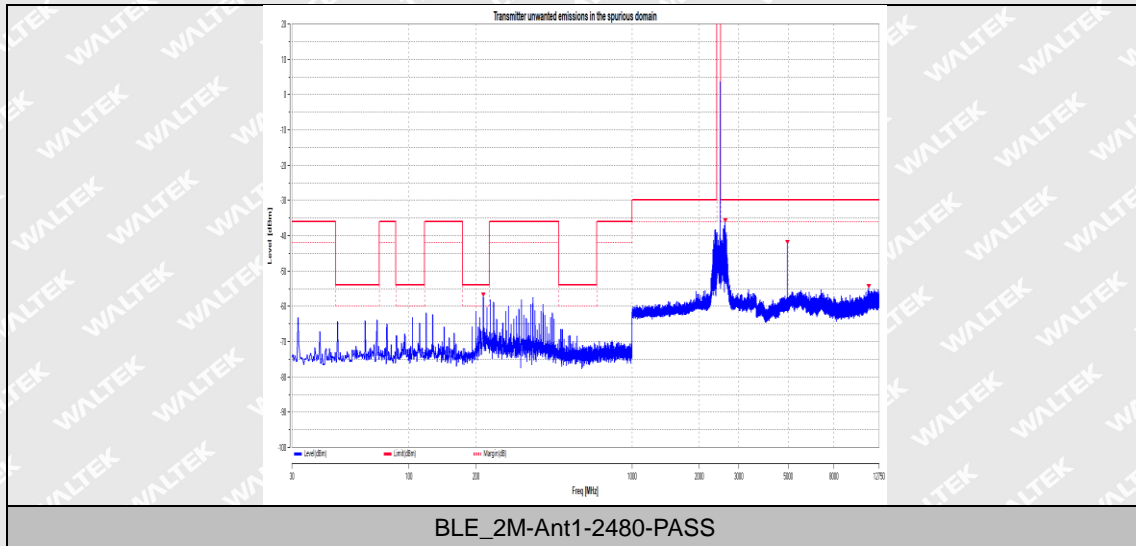
BLE\_1M-Ant1-2402-PASS



BLE\_1M-Ant1-2480-PASS



BLE\_2M-Ant1-2402-PASS

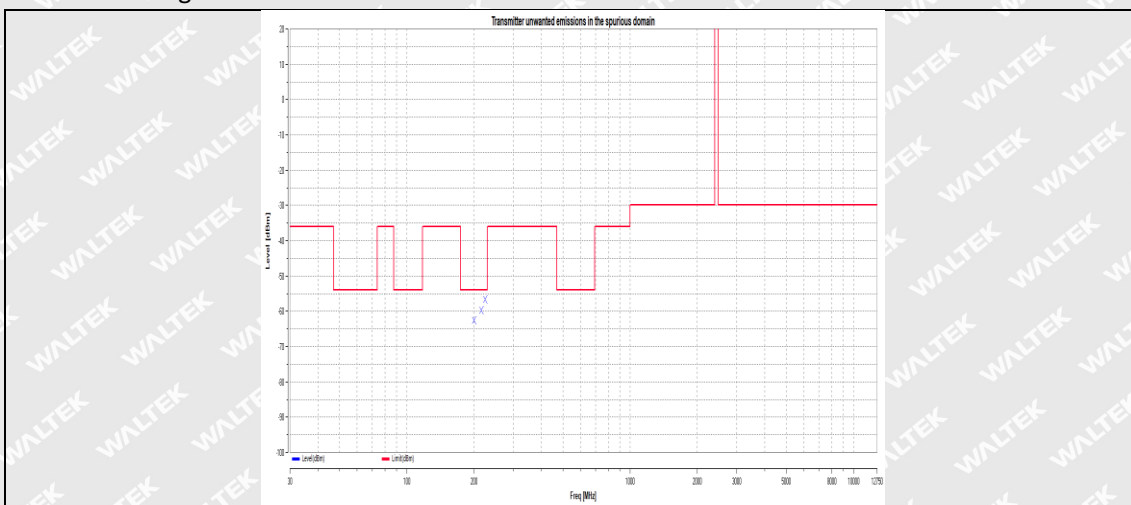


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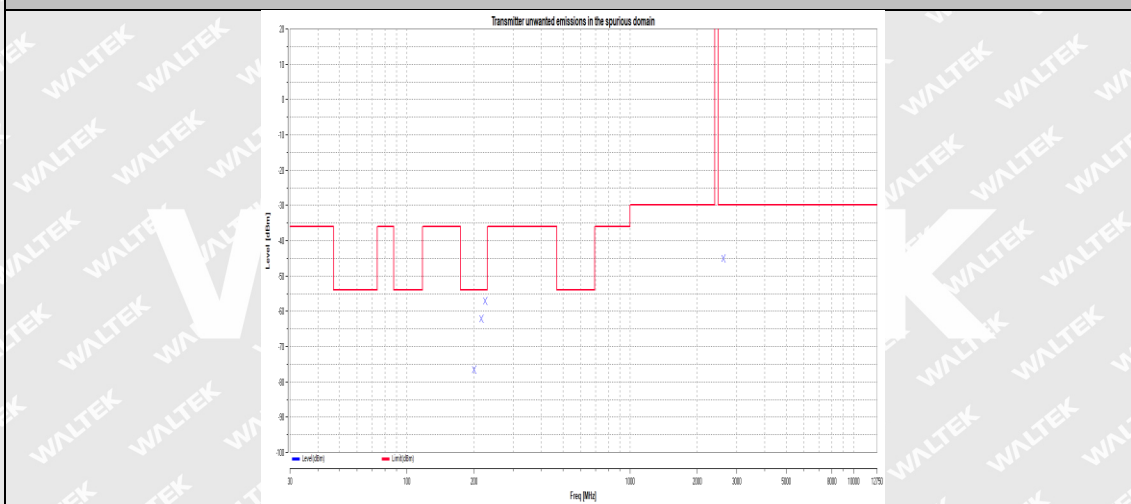


### Test Graphs- Emissions identified during the pre-scan

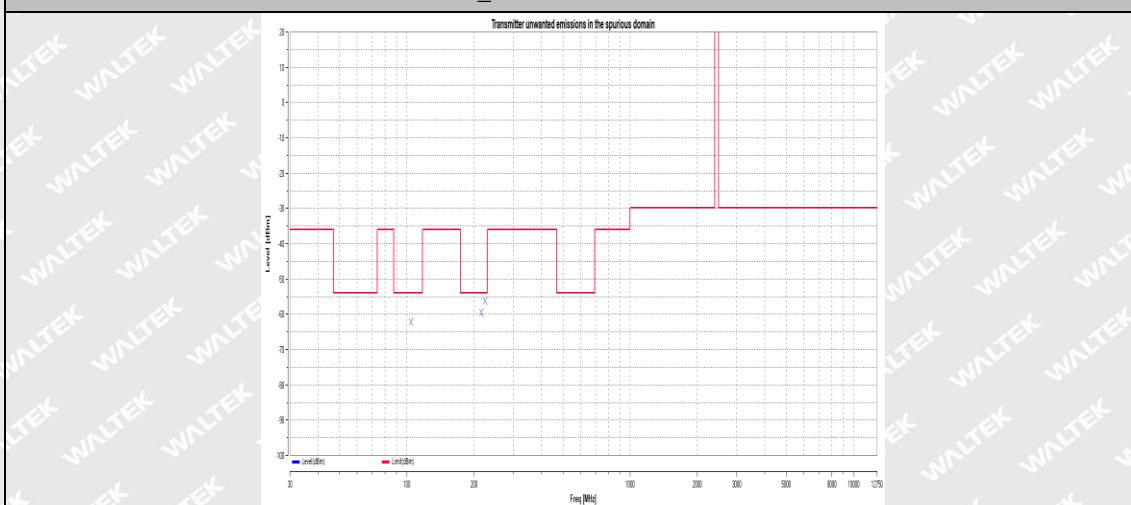
**Note:** This test case only applicable the test result fall within the 6 dB range below the limit during the Pre-scan.



BLE\_1M-Ant1-2402-PASS

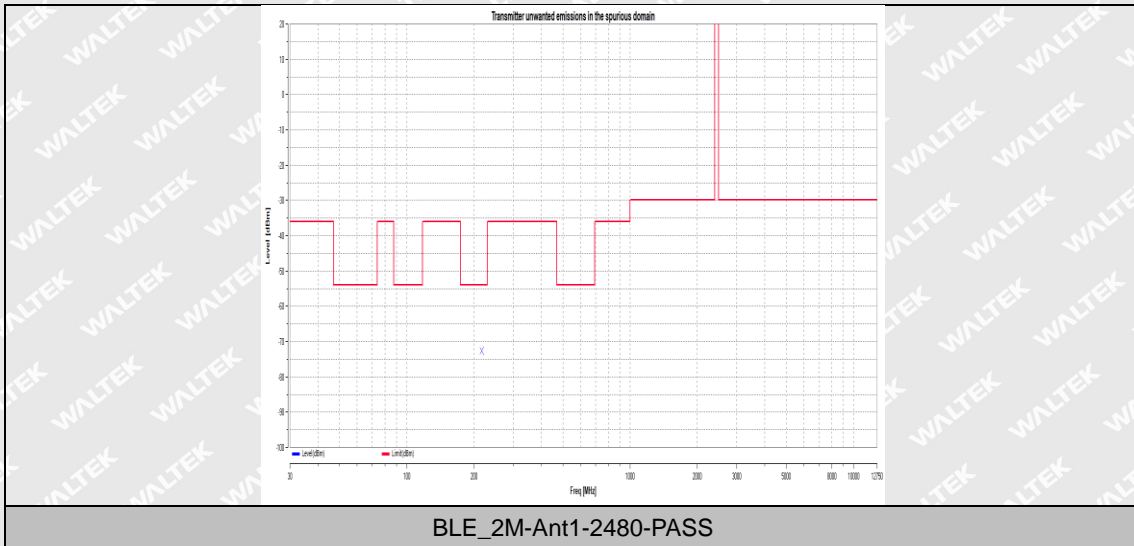


BLE\_1M-Ant1-2480-PASS



BLE\_2M-Ant1-2402-PASS





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## Appendix F: Receiver spurious emissions

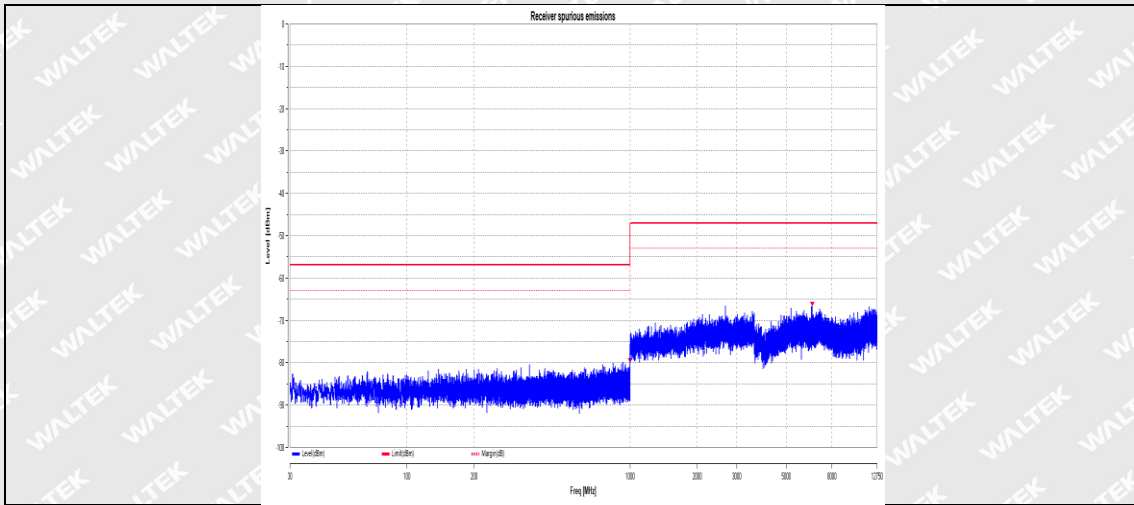
### Test Result-Pre-scan

TestMode	Antenna	Frequency[MHz]	Freq. [MHz]	Level[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	998.25	-79.89	-57.00	PASS
BLE_1M	Ant1	2402	6531.12	-66.54	-47.00	PASS
BLE_1M	Ant1	2480	428.57	-79.98	-57.00	PASS
BLE_1M	Ant1	2480	12019.93	-66.56	-47.00	PASS
BLE_2M	Ant1	2402	947.18	-79.65	-57.00	PASS
BLE_2M	Ant1	2402	11496.28	-66.68	-47.00	PASS
BLE_2M	Ant1	2480	904.99	-79.81	-57.00	PASS
BLE_2M	Ant1	2480	12304.68	-66.67	-47.00	PASS

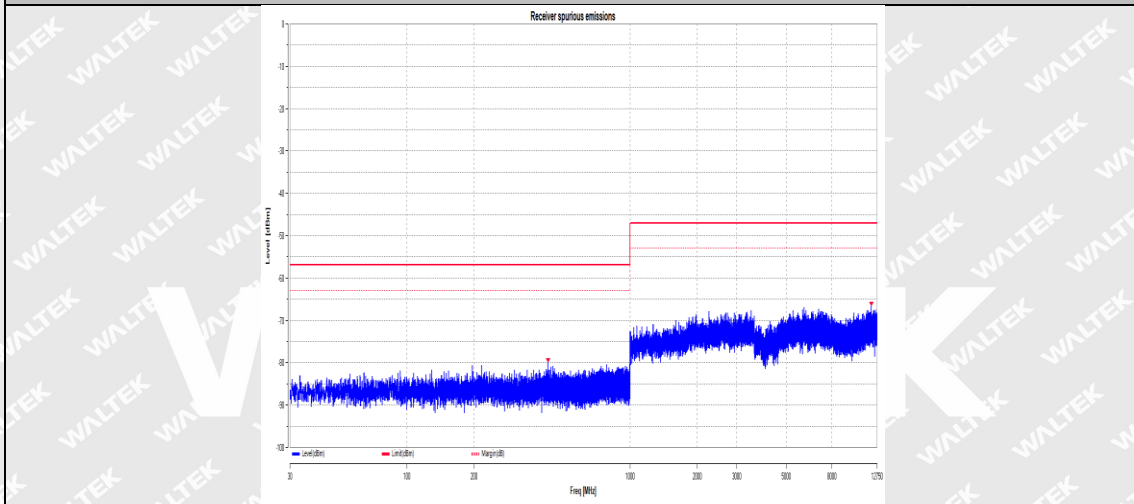
# WALTEK



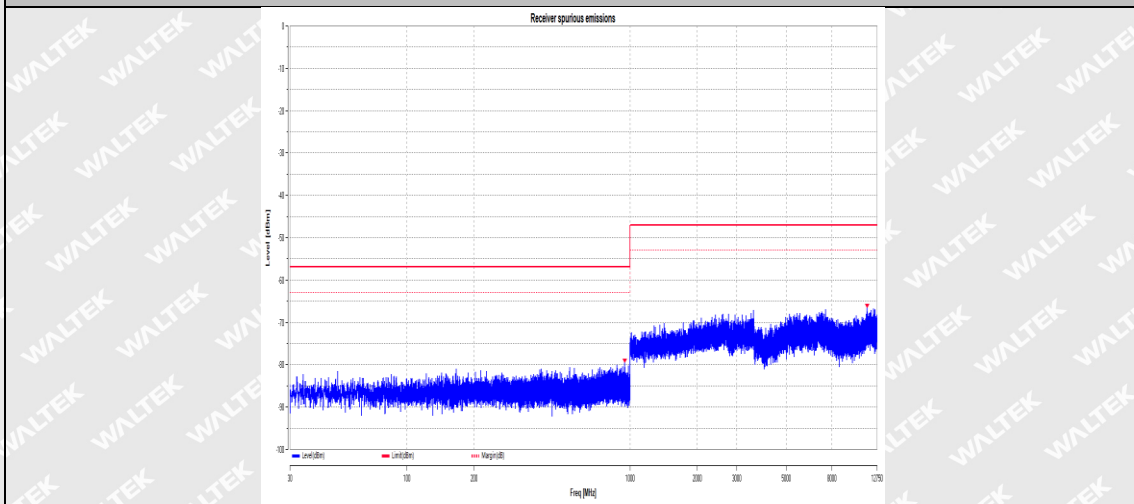
### Test Graphs-Pre-scan



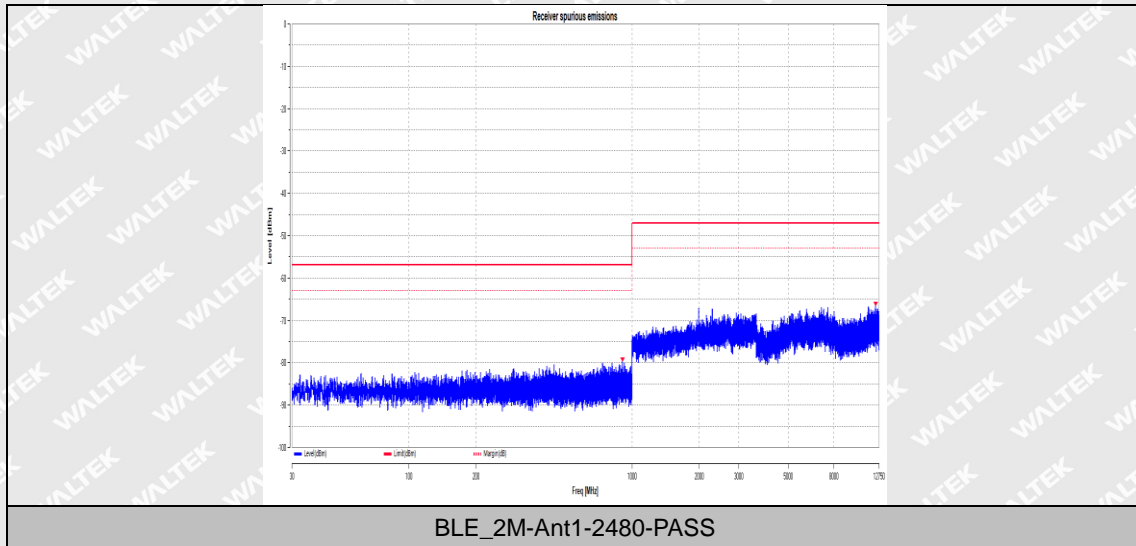
BLE\_1M-Ant1-2402-PASS



BLE\_1M-Ant1-2480-PASS



BLE\_2M-Ant1-2402-PASS



# WALTEK