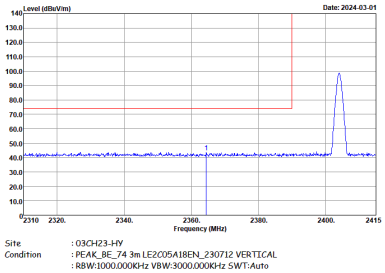
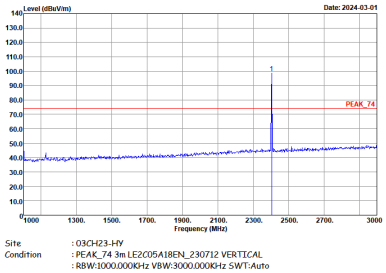
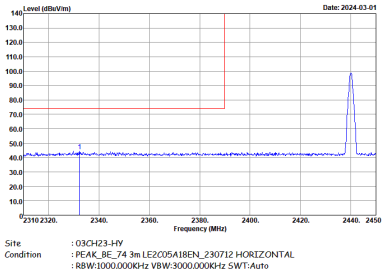
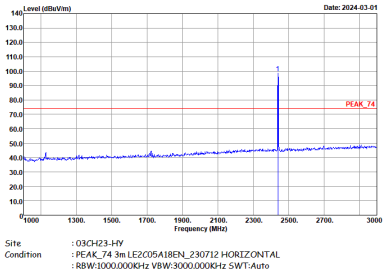
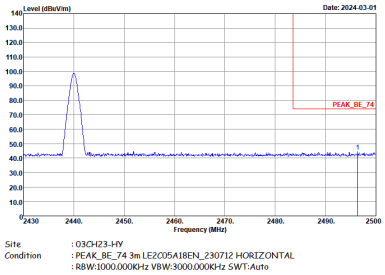
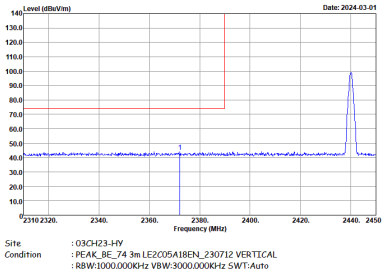
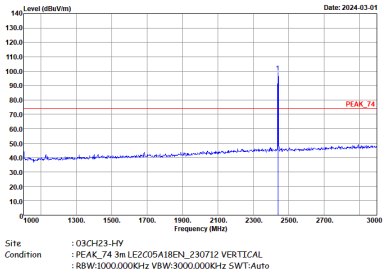
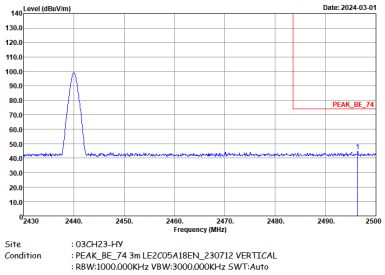
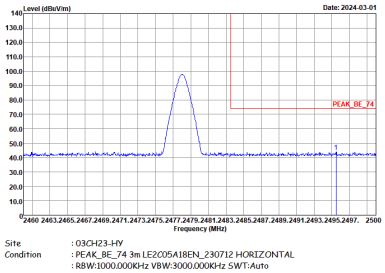
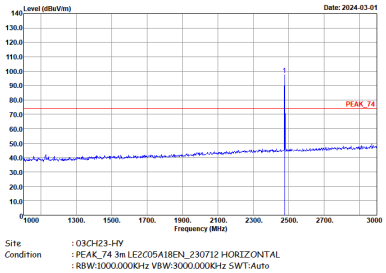
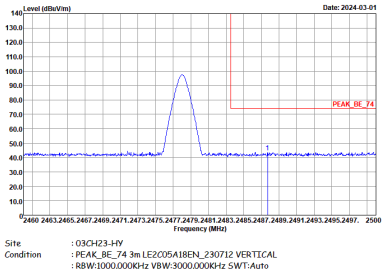
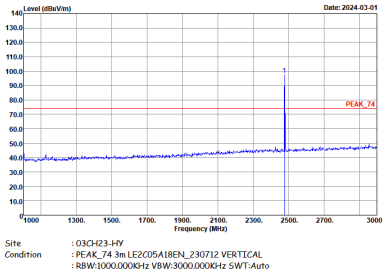
BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH02 2404MHz	
3	Vertical	Fundamental
Peak		

BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH38 2440MHz	
3	Horizontal	Fundamental
Peak		
Peak		Left blank

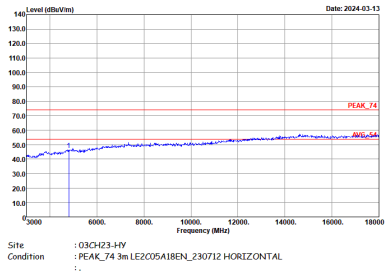
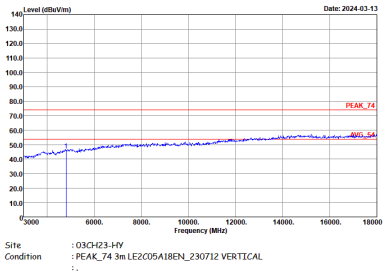
BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH38 2440MHz	
3	Vertical	Fundamental
Peak		
Peak		Left blank

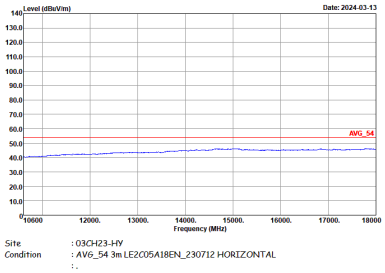
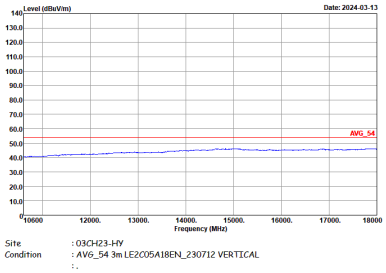
BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH76 2478MHz	
3	Horizontal	Fundamental
Peak		

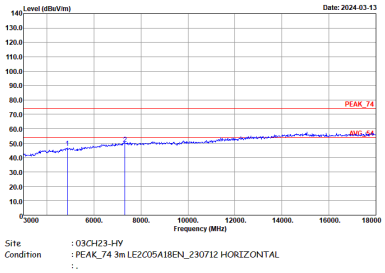
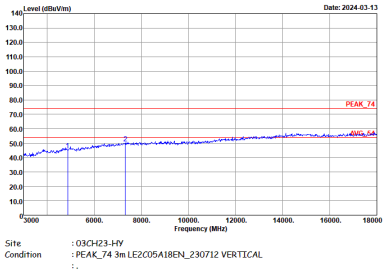
BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH76 2478MHz	
3	Vertical	Fundamental
Peak		

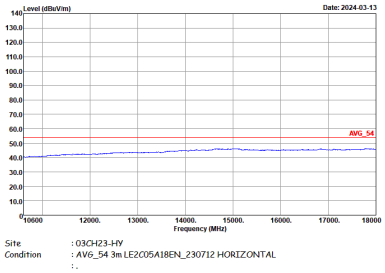
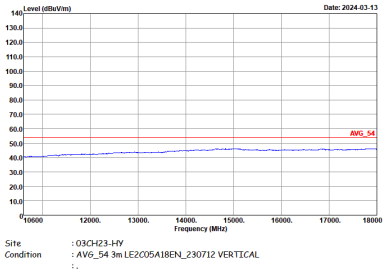
2.4GHz 2400~2483.5MHz

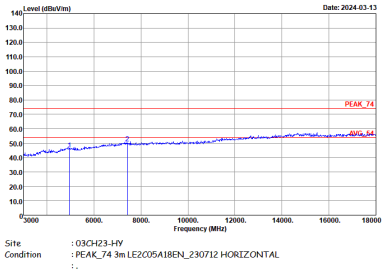
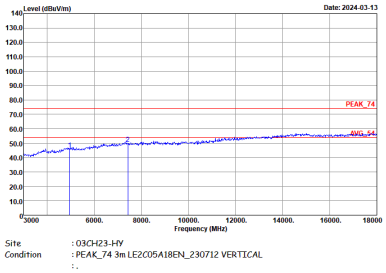
BLE (Harmonic @ 3m)

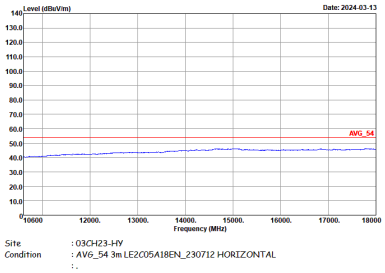
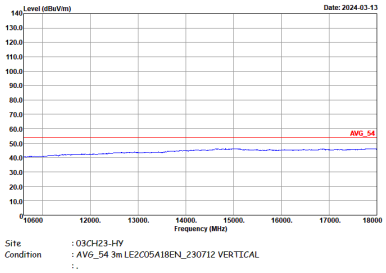
BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	BLE CH02 2404MHz	
3	Horizontal	Vertical
Peak Avg.		

BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	BLE CH02 2404MHz	
3	Horizontal	Vertical
10.6G ~18G Avg.		

BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	BLE CH38 2440MHz	
3	Horizontal	Vertical
Peak Avg.		

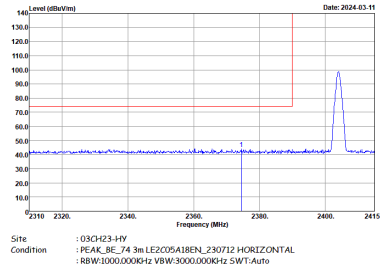
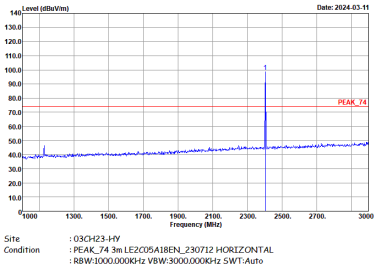
BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	BLE CH38 2440MHz	
3	Horizontal	Vertical
10.6G ~18G Avg.		

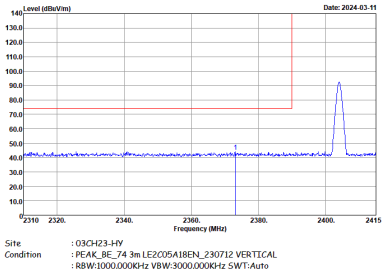
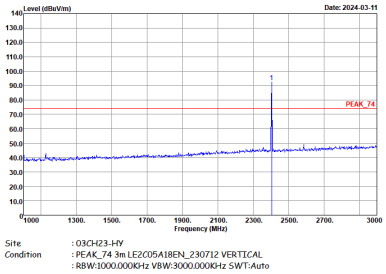
BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	BLE CH76 2478MHz	
3	Horizontal	Vertical
Peak Avg.		

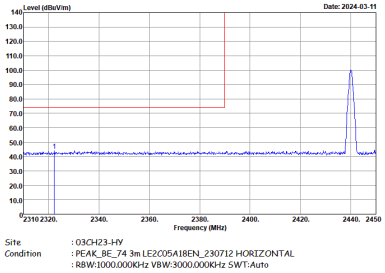
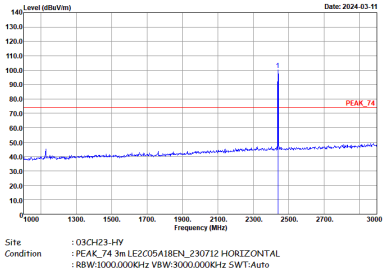
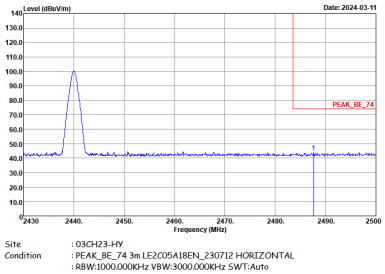
BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	BLE CH76 2478MHz	
3	Horizontal	Vertical
10.6G ~18G Avg.		

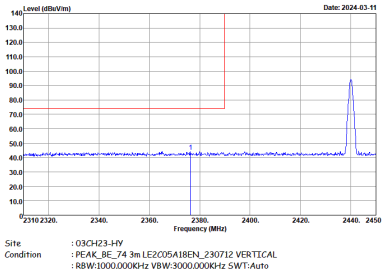
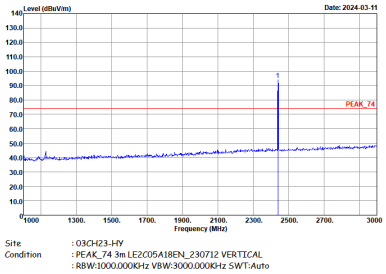
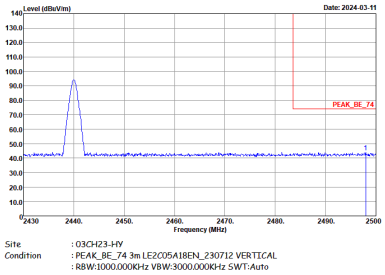
2.4GHz 2400~2483.5MHz

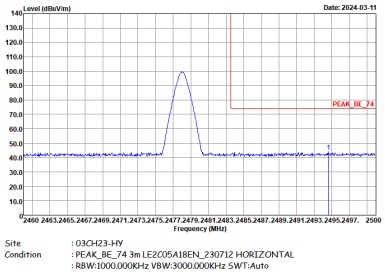
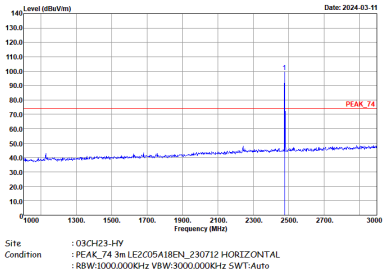
BLE (Band Edge @ 3m)

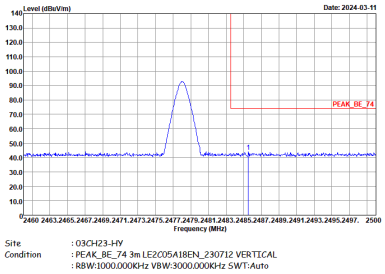
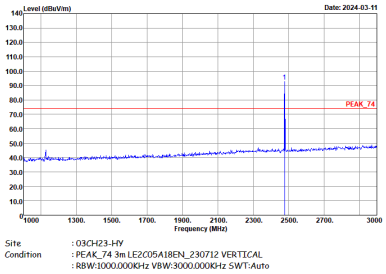
BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH02 2404MHz	
4	Horizontal	Fundamental
Peak		

BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH02 2404MHz	
4	Vertical	Fundamental
Peak		

BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH38 2440MHz	
4	Horizontal	Fundamental
Peak		
Peak		Left blank

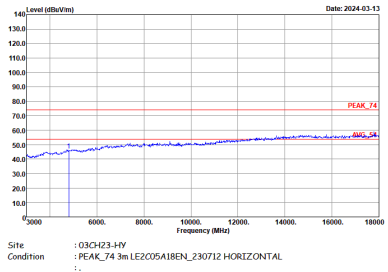
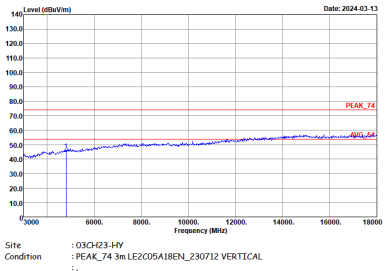
BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH38 2440MHz	
4	Vertical	Fundamental
Peak		
Peak		Left blank

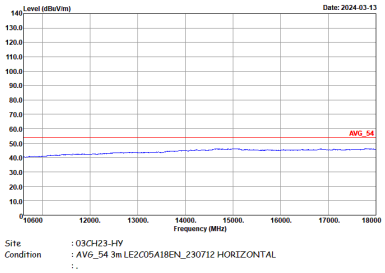
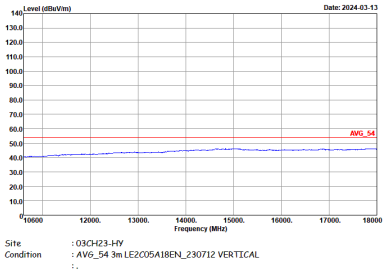
BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH76 2478MHz	
4	Horizontal	Fundamental
Peak		

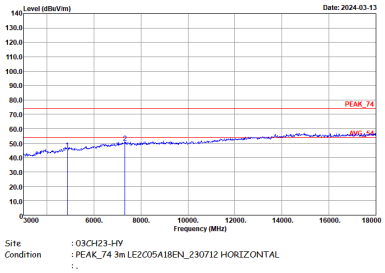
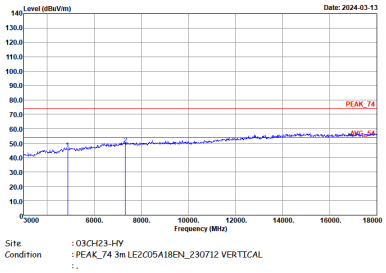
BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH76 2478MHz	
4	Vertical	Fundamental
Peak		

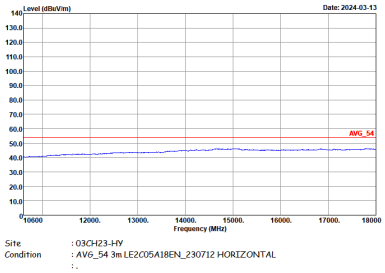
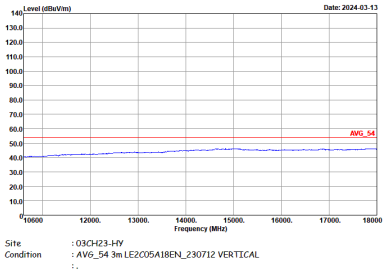
2.4GHz 2400~2483.5MHz

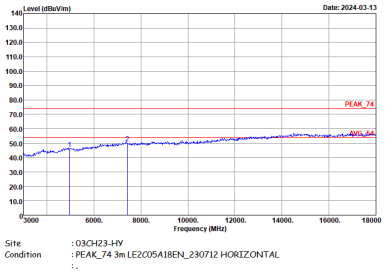
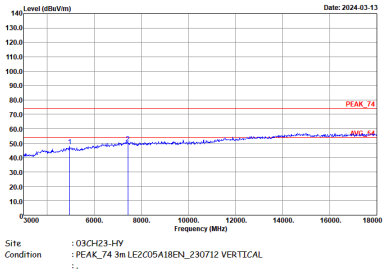
BLE (Harmonic @ 3m)

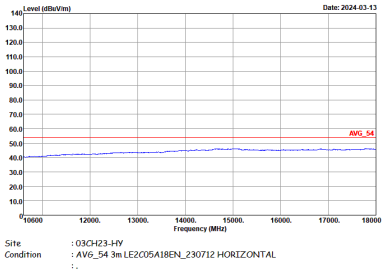
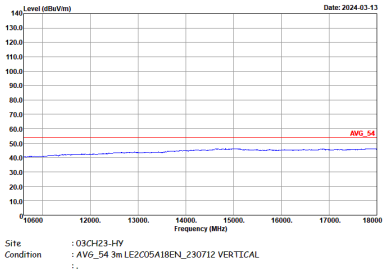
BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	BLE CH02 2404MHz	
4	Horizontal	Vertical
Peak Avg.		

BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	BLE CH02 2404MHz	
4	Horizontal	Vertical
10.6G ~18G Avg.		

BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	BLE CH38 2440MHz	
4	Horizontal	Vertical
Peak Avg.		

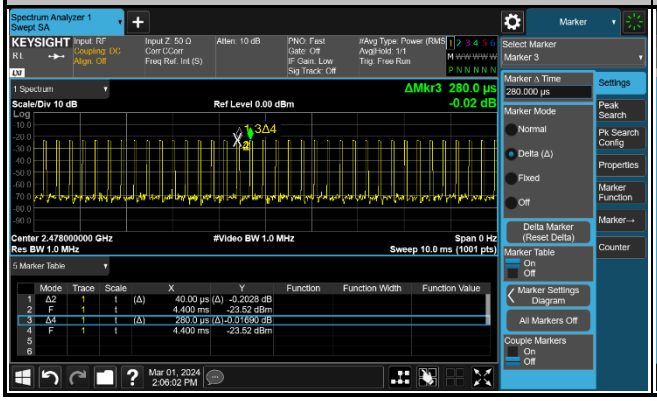
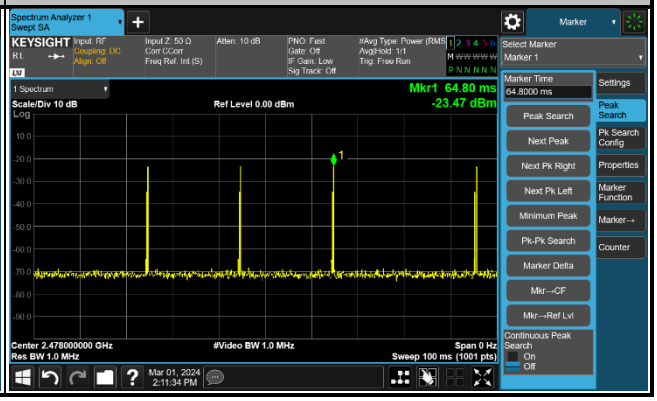
BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	BLE CH38 2440MHz	
4	Horizontal	Vertical
10.6G ~18G Avg.		

BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	BLE CH76 2478MHz	
4	Horizontal	Vertical
Peak Avg.		

BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	BLE CH76 2478MHz	
4	Horizontal	Vertical
10.6G ~18G Avg.		

Appendix E. Duty Cycle Plots

< Ant. 3>

Bluetooth - LE for 1Mbps Single Burst Time	Bluetooth - LE for 1Mbps Number of Burst within 100ms
	

Note:

1. Worst case Duty cycle = on time/100 milliseconds = 4 * 0.040 / 100 = 0.16%
2. Worst case Duty cycle correction factor = 20*log(Duty cycle) = -55.92 dB

Duty Cycle Correction Factor Consideration for AFH mode:

Bluetooth normal hopping rate is 1600Hz and reduced to 800Hz in AFH mode; due to the reduced number of hopping frequencies, with the same packet configuration the dwell time in each channel frequency within 100msec period is longer in AFH mode than normal mode.

In AFH mode, the minimum hopping frequencies are 20, to get the longest dwell time DH5 packet is observed; the on time period to have DH5 packet completing one hopping sequence is

0.040 ms x 40 channels = 1.6 ms

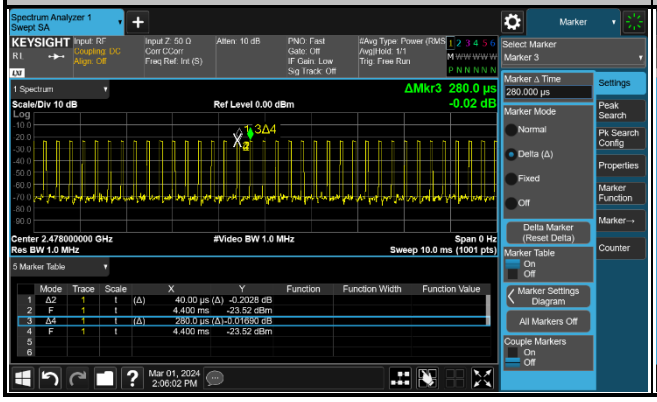
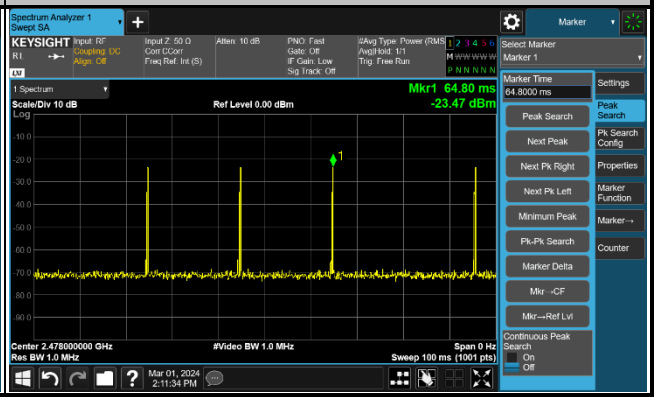
There cannot be 2 complete hopping sequences within 100ms period, considering the random hopping behavior, maximum 2 hops can be possibly observed within the period. [100 ms / 0.8 ms] = 2 hops

Thus, the maximum possible ON time:

0.040 ms x 4 =0.16ms

Worst case Duty Cycle Correction factor, which is derived from the maximum possible ON time,

20 x log(0.16 ms/100 ms) = -55.92 dB

Bluetooth - LE for 2Mbps Single Burst Time	Bluetooth - LE for 2Mbps Number of Burst within 100ms
	

Note:

1. Worst case Duty cycle = on time/100 milliseconds = 4 * 0.040 / 100 = 0.16%
2. Worst case Duty cycle correction factor = 20*log(Duty cycle) = -55.92 dB

Duty Cycle Correction Factor Consideration for AFH mode:

Bluetooth normal hopping rate is 1600Hz and reduced to 800Hz in AFH mode; due to the reduced number of hopping frequencies, with the same packet configuration the dwell time in each channel frequency within 100msec period is longer in AFH mode than normal mode.

In AFH mode, the minimum hopping frequencies are 20, to get the longest dwell time DH5 packet is observed; the on time period to have DH5 packet completing one hopping sequence is

0.040 ms x 40 channels = 1.6 ms

There cannot be 2 complete hopping sequences within 100ms period, considering the random hopping behavior, maximum 2 hops can be possibly observed within the period. [100 ms / 0.8 ms] = 2 hops

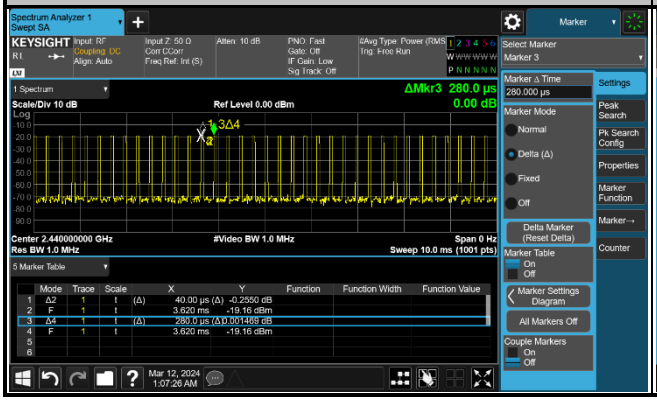
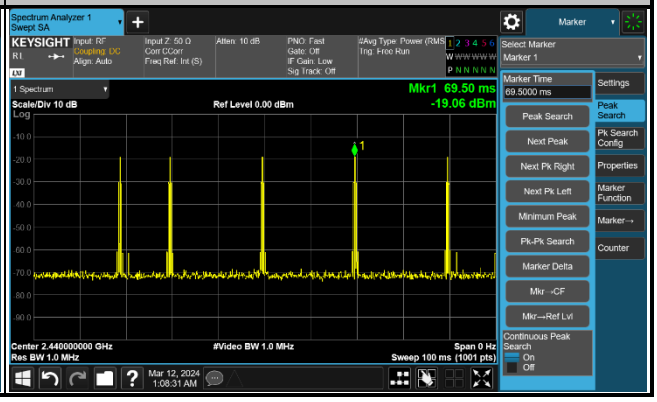
Thus, the maximum possible ON time:

0.040 ms x 4 = 0.16 ms

Worst case Duty Cycle Correction factor, which is derived from the maximum possible ON time,

20 x log(0.16 ms/100 ms) = -55.92 dB

< Ant. 4>

Bluetooth - LE for 1Mbps Single Burst Time	Bluetooth - LE for 1Mbps Number of Burst within 100ms
	

Note:

1. Worst case Duty cycle = on time/100 milliseconds = 5 * 0.040 / 100 = 0.20%
2. Worst case Duty cycle correction factor = 20*log(Duty cycle) = -53.98 dB

Duty Cycle Correction Factor Consideration for AFH mode:

Bluetooth normal hopping rate is 1600Hz and reduced to 800Hz in AFH mode; due to the reduced number of hopping frequencies, with the same packet configuration the dwell time in each channel frequency within 100msec period is longer in AFH mode than normal mode.

In AFH mode, the minimum hopping frequencies are 20, to get the longest dwell time DH5 packet is observed; the on time period to have DH5 packet completing one hopping sequence is

0.040 ms x 50 channels = 2 ms

There cannot be 2 complete hopping sequences within 100ms period, considering the random hopping behavior, maximum 2 hops can be possibly observed within the period. [100 ms / 0.8 ms] = 2 hops

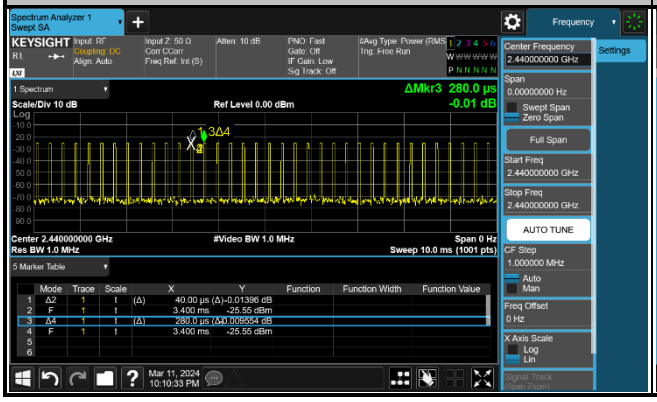
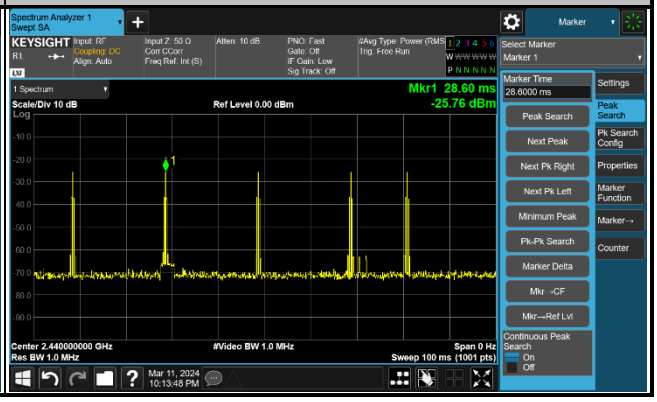
Thus, the maximum possible ON time:

0.040 ms x 5 = 0.2 ms

Worst case Duty Cycle Correction factor, which is derived from the maximum possible ON time,

*20 x log(0.2 ms/*100 ms) = -53.98 dB

< Ant. 4>

Bluetooth - LE for 2Mbps Single Burst Time	Bluetooth - LE for 2Mbps Number of Burst within 100ms
	

Note:

1. Worst case Duty cycle = on time/100 milliseconds = 5 * 0.044 / 100 =0.20 %
2. Worst case Duty cycle correction factor = 20*log(Duty cycle) = -53.98 dB

Duty Cycle Correction Factor Consideration for AFH mode:

Bluetooth normal hopping rate is 1600Hz and reduced to 800Hz in AFH mode; due to the reduced number of hopping frequencies, with the same packet configuration the dwell time in each channel frequency within 100msec period is longer in AFH mode than normal mode.

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0.040 ms x 5 = 0.2 ms

Worst case Duty Cycle Correction factor, which is derived from the maximum possible ON time,

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———THE END———