Appendix C. Radiated Spurious Emission Test Data

Test Engineer :	Leo Li , Karl Hou and, Lucifer Jiang	**Temperature :**	19~23°C
		Relative Humidity :	60~64.5%

Note symbol

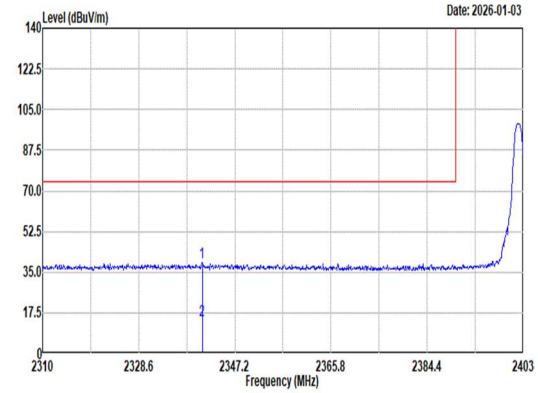
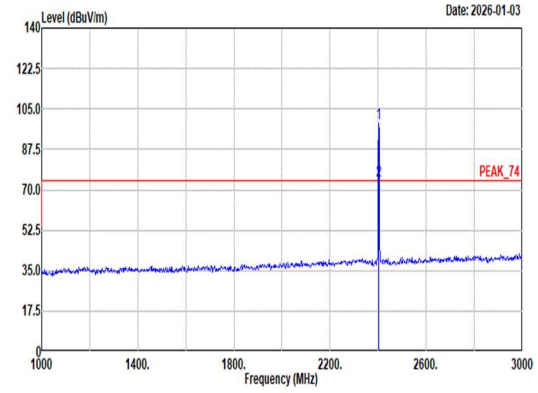
-L	**Low channel location**
-R	**High channel location**

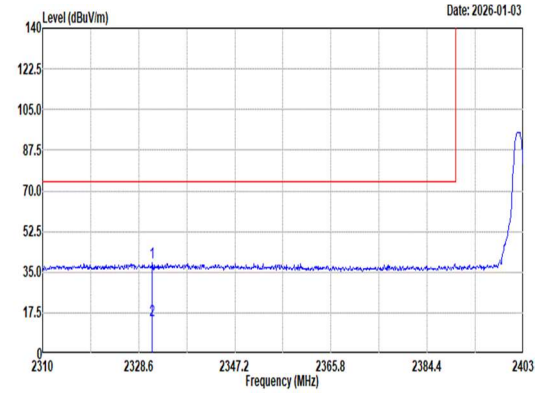
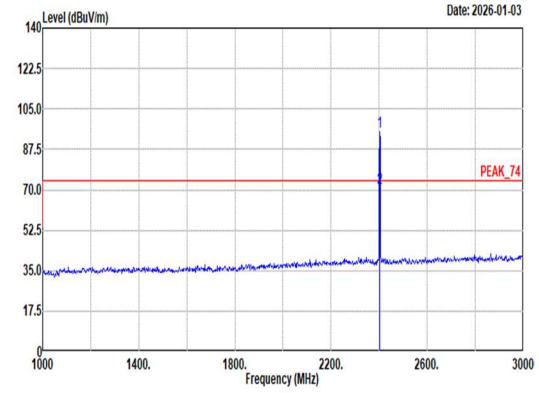
C2-1.Radiated Spurious Emission Test Modes

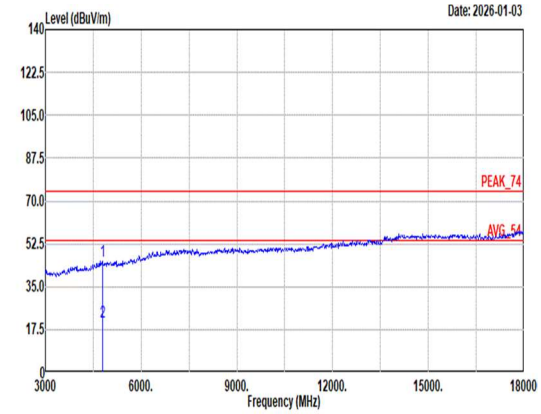
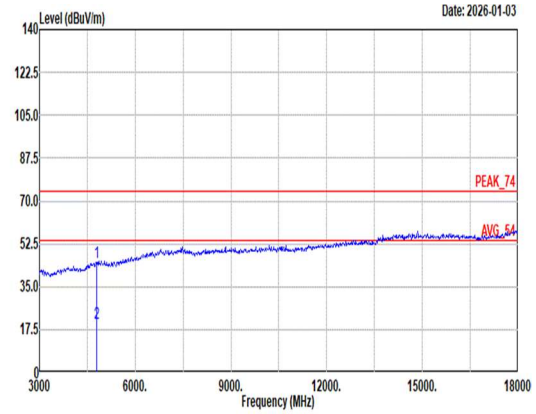
Mode	Band (MHz)	Antenna	Modulation	Channel	Frequency	Data Rate	RU	Remark
Mode 10	2400-2483.5	7	Bluetooth BR_GFSK	00	2402	1Mbps	-	-
Mode 11	2400-2483.5	7	Bluetooth BR_GFSK	39	2441	1Mbps	-	-
Mode 12	2400-2483.5	7	Bluetooth BR_GFSK	78	2480	1Mbps	-	-

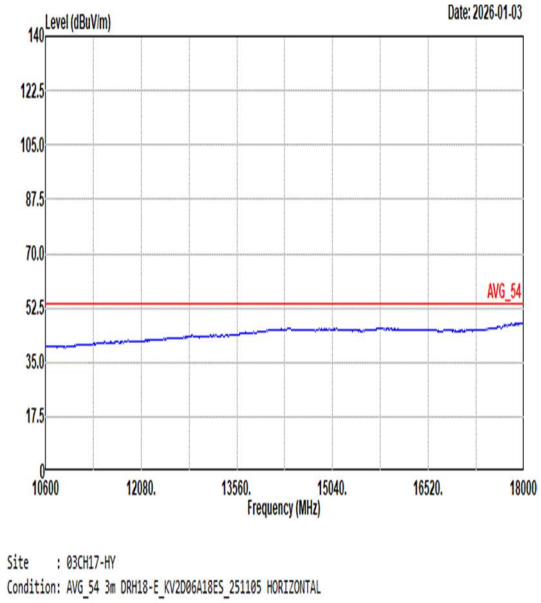
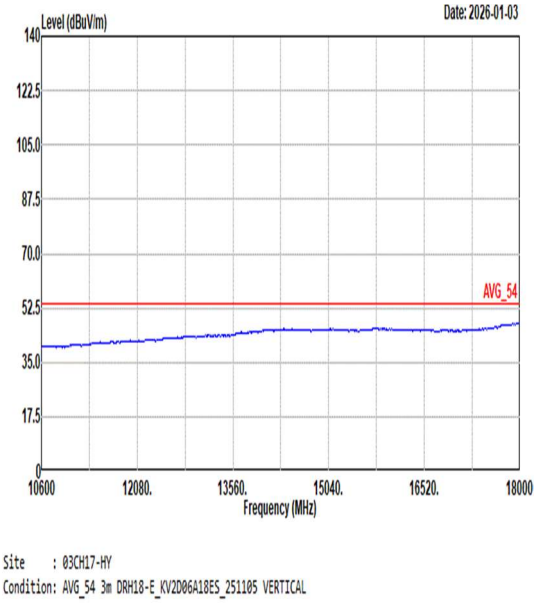
C2-2.Summary of each worse mode

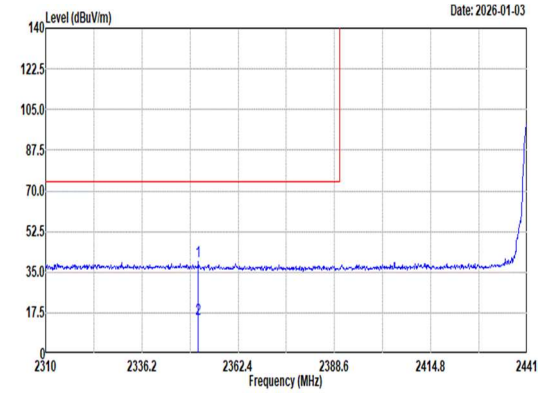
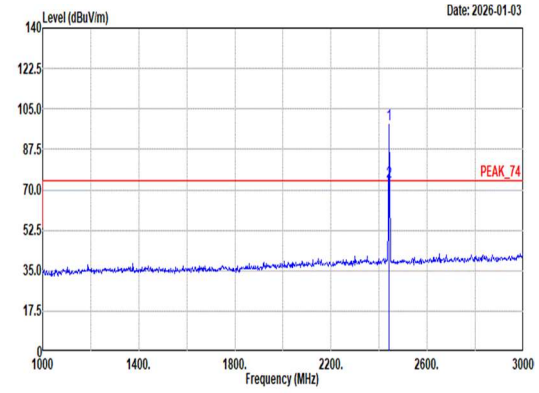
Mode	Modulation	Ch.	Freq. (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol.	Peak Avg.	Result	RU	Remark
10	Bluetooth BR_GFSK	00	2331.20	38.99	74.00	-35.01	V	Peak	Pass	-	Band Edge
	Bluetooth BR_GFSK	00	4804.00	45.41	74.00	-28.59	H	Peak	Pass	-	Harmonic
11	Bluetooth BR_GFSK	39	2351.53	39.66	74.00	-34.34	H	Peak	Pass	-	Band Edge
	Bluetooth BR_GFSK	39	7323.00	50.09	74.00	-23.91	H	Peak	Pass	-	Harmonic
12	Bluetooth BR_GFSK	78	2483.52	42.57	74.00	-31.43	H	Peak	Pass	-	Band Edge
	Bluetooth BR_GFSK	78	7440.00	49.29	74.00	-24.71	H	Peak	Pass	-	Harmonic

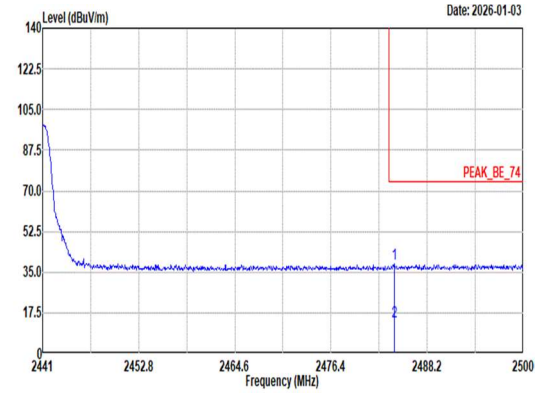
Mode	10	
	Band Edge	
	2400-2483.5_Bluetooth BR_GFSK_CH00_2402MHz	
ANT	7	
Pol.	Horizontal	Fundamental
Peak	 Site : 03CH17-HY Condition: PEAK_BE_74 3m DRH18-E_KV2D06A18ES_251105 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Limit Read Ant Cable Preamp Aux APos TPos Freq Level Line Margin Level Factor Loss Factor Factor Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 2340.88 38.94 74.00 -35.06 40.74 27.10 7.61 36.51 0.00 100 311 Peak 2 2340.88 14.15 54.00 -39.85 -- -- -- -- -- -- -- AVERAGE	 Site : 03CH17-HY Condition: PEAK_74 3m DRH18-E_KV2D06A18ES_251105 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Limit Read Ant Cable Preamp Aux APos TPos Freq Level Line Margin Level Factor Loss Factor Factor Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 2402.00 98.95 ------ ------ 101.01 26.80 7.68 36.54 0.00 100 311 Peak 2 2402.00 74.16 ------ ------ -- -- -- -- -- -- -- Average

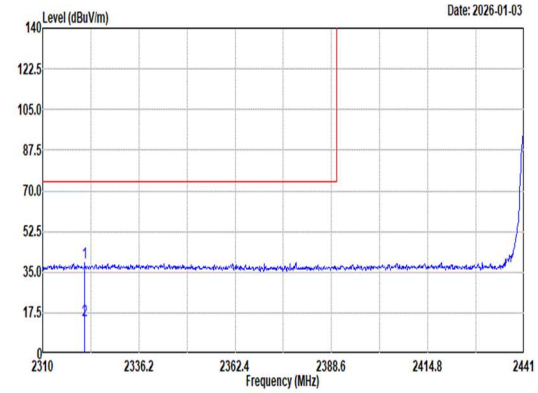
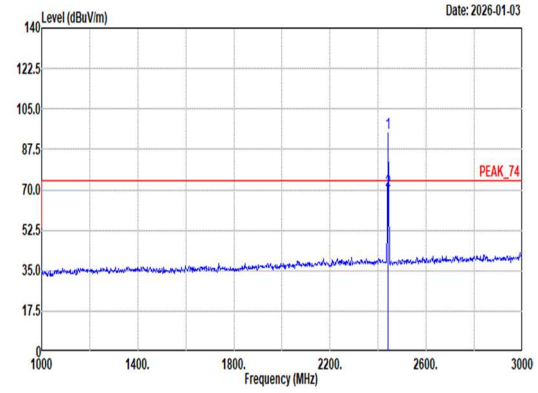
Mode	10	
	Band Edge	
	2400-2483.5_Bluetooth BR_GFSK_CH00_2402MHz	
ANT	7	
Pol.	Vertical	Fundamental
Peak	 Site : 03CH17-HY Condition: PEAK_BE_74 3m DRH18-E_KV2D06A18ES_251105 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 2331.20 38.99 74.00 -35.01 40.80 27.10 7.60 36.51 0.00 100 84 Peak 2 2331.20 14.20 54.00 -39.80 -- -- -- -- -- -- -- AVERAGE	 Site : 03CH17-HY Condition: PEAK_74 3m DRH18-E_KV2D06A18ES_251105 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 2402.00 95.33 ------ ------ 97.39 26.80 7.68 36.54 0.00 100 84 Peak 2 2402.00 70.54 ------ ------ -- -- -- -- -- -- -- Average

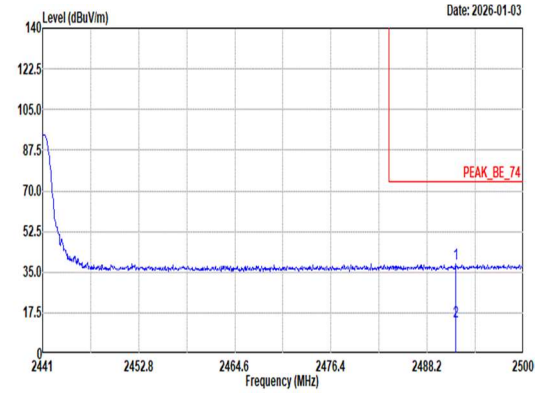
Mode	10	
	Harmonic	
	2400-2483.5_Bluetooth BR_GFSK_CH00_2402MHz	
ANT	7	
Pol.	Horizontal	Vertical
Peak Avg	 Site : 03CH17-HY Condition: PEAK_74 3m DRH18-E_KV2D06A18ES_251105 HORIZONTAL Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 4804.00 45.41 74.00 -28.59 37.63 32.21 12.42 37.68 0.83 -- -- Peak 2 4804.00 20.62 54.00 -33.38 -- -- -- -- -- -- -- Average	 Site : 03CH17-HY Condition: PEAK_74 3m DRH18-E_KV2D06A18ES_251105 VERTICAL Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 4804.00 45.08 74.00 -28.92 37.30 32.21 12.42 37.68 0.83 -- -- Peak 2 4804.00 20.29 54.00 -33.71 -- -- -- -- -- -- -- Average

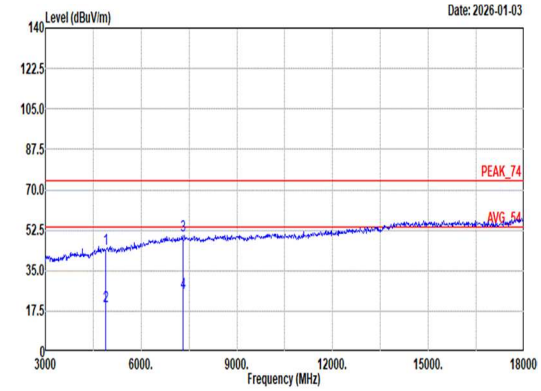
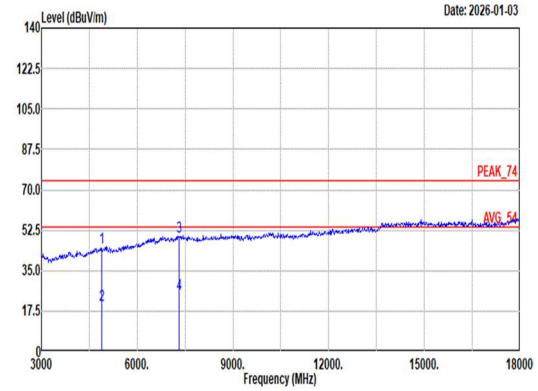
Mode	10	
	Harmonic	
	2400-2483.5_Bluetooth BR_GFSK_CH00_2402MHz	
ANT	7	
Pol.	Horizontal	Vertical
10.6G ~18G Avg		

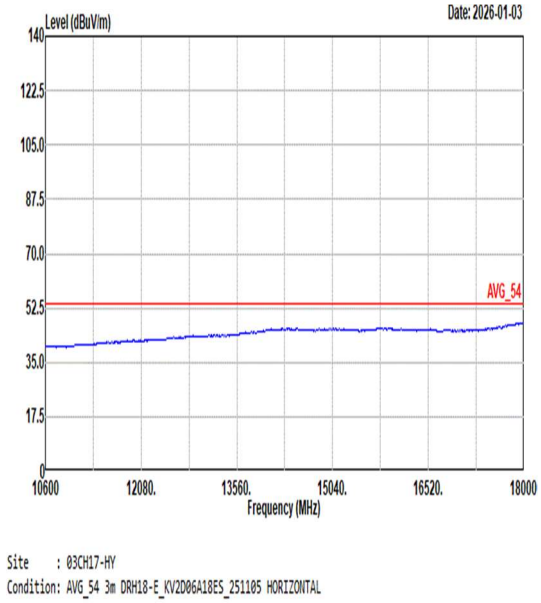
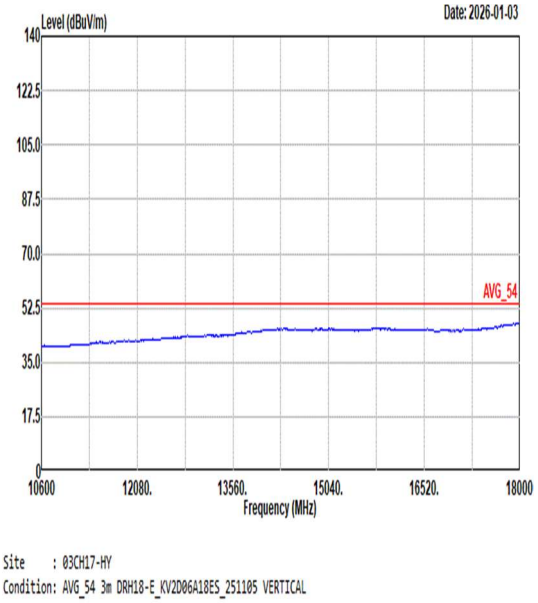
Mode	11	
	Band Edge - L	
	2400-2483.5_Bluetooth BR_GFSK_CH39_2441MHz	
ANT	7	
Pol.	Horizontal	Fundamental
Peak	 Site : 03CH17-HY Condition: PEAK_BE_74 3m DRH18-E_KV2D06A18ES_251105 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Limit Read Ant Cable Preamp Aux APos TPos Freq Level Line Margin Level Factor Loss Factor Factor Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 2351.53 39.66 74.00 -34.34 41.48 27.08 7.62 36.52 0.00 100 274 Peak 2 2351.53 14.87 54.00 -39.13 -- -- -- -- -- -- -- AVERAGE	 Site : 03CH17-HY Condition: PEAK_74 3m DRH18-E_KV2D06A18ES_251105 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Limit Read Ant Cable Preamp Aux APos TPos Freq Level Line Margin Level Factor Loss Factor Factor Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 2441.00 98.33 ------ ------ 100.54 26.60 7.75 36.56 0.00 100 274 Peak 2 2441.00 73.54 ------ ------ -- -- -- -- -- -- -- Average

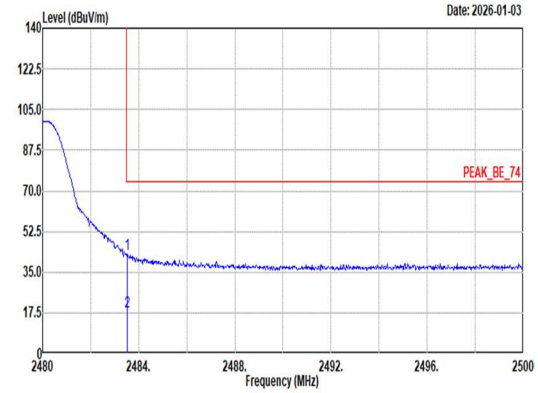
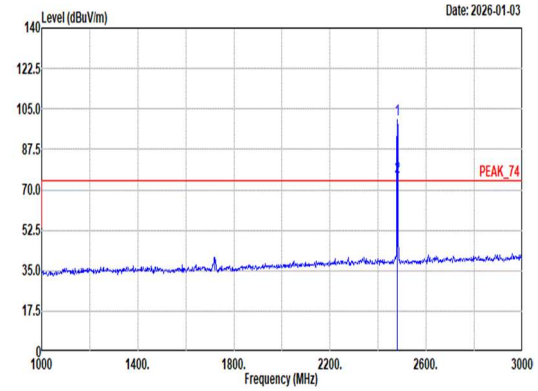
Mode	11	
	Band Edge - R	
	2400-2483.5_Bluetooth BR_GFSK_CH39_2441MHz	
ANT	7	
Pol.	Horizontal	Fundamental
Peak	 Site : 03CH17-HY Condition: PEAK_BE_74 3m DRH18-E_KV2D06A18ES_251105 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Limit Read Ant Cable Preamp Aux APos TPos Freq Level Line Margin Level Factor Loss Factor Factor Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 2484.19 38.35 74.00 -35.65 40.41 26.70 7.82 36.58 0.00 100 274 Peak 2 2484.19 13.56 54.00 -40.44 -- -- -- -- -- -- -- AVERAGE	Blank

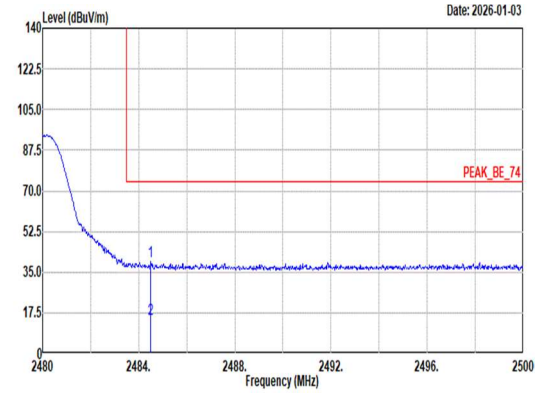
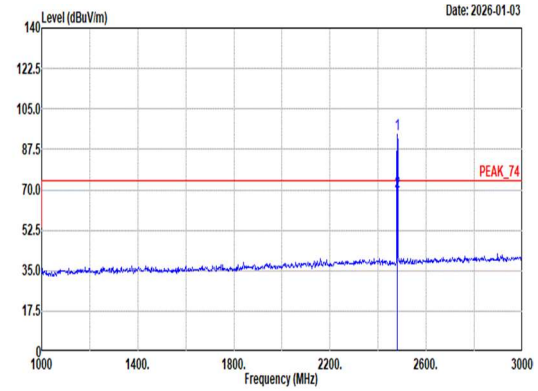
Mode	11	
	Band Edge - L	
	2400-2483.5_Bluetooth BR_GFSK_CH39_2441MHz	
ANT	7	
Pol.	Vertical	Fundamental
Peak	 Site : 03CH17-HY Condition: PEAK_BE_74 3m DRH18-E_KV2D06A18ES_251105 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Limit Read Ant Cable Preamp Aux APos TPos Freq Level Line Margin Level Factor Loss Factor Factor Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 2321.53 39.18 74.00 -34.82 41.07 27.02 7.59 36.50 0.00 100 90 Peak 2 2321.53 14.39 54.00 -39.61 -- -- -- -- -- -- -- AVERAGE	 Site : 03CH17-HY Condition: PEAK_74 3m DRH18-E_KV2D06A18ES_251105 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Limit Read Ant Cable Preamp Aux APos TPos Freq Level Line Margin Level Factor Loss Factor Factor Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 2441.00 94.46 ------ ------ 96.67 26.60 7.75 36.56 0.00 100 90 Peak 2 2441.00 69.67 ------ ------ -- -- -- -- -- -- -- Average

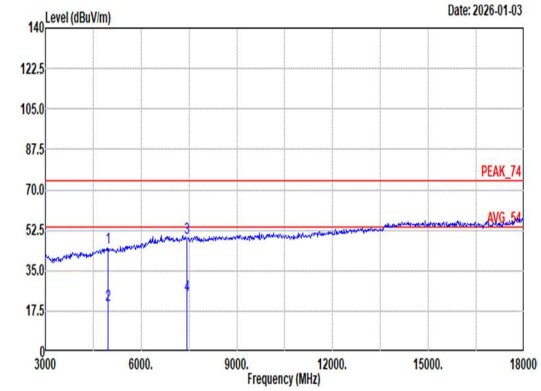
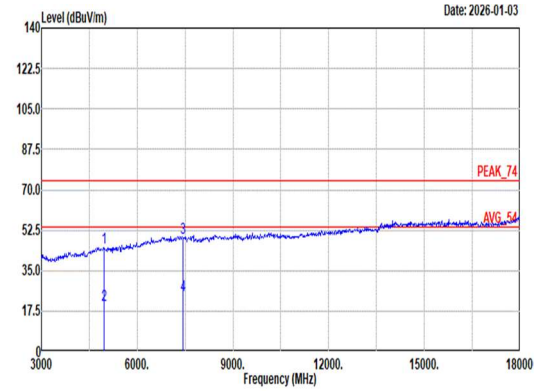
Mode	11	
	Band Edge - R	
	2400-2483.5_Bluetooth BR_GFSK_CH39_2441MHz	
ANT	7	
Pol.	Vertical	Fundamental
Peak	 Site : 03CH17-HY Condition: PEAK_BE_74 3m DRH18-E_KV2D06A18ES_251105 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Limit Read Ant Cable Preamp Aux APos TPos Freq Level Line Margin Level Factor Loss Factor Factor Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 2491.68 38.32 74.00 -35.68 40.35 26.72 7.84 36.59 0.00 100 90 Peak 2 2491.68 13.53 54.00 -40.47 -- -- -- -- -- -- -- AVERAGE	Blank

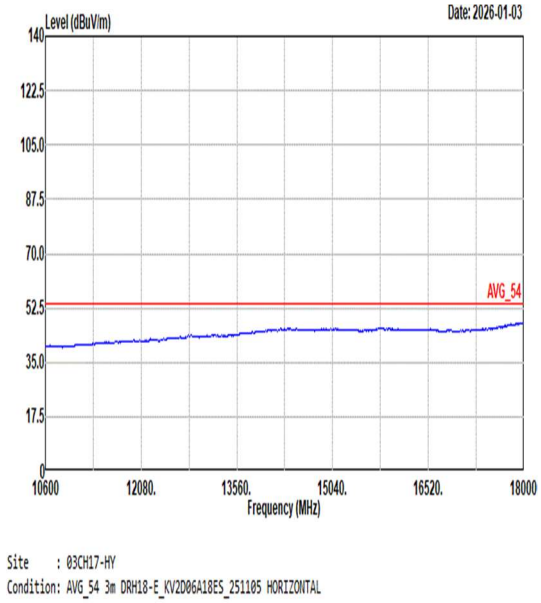
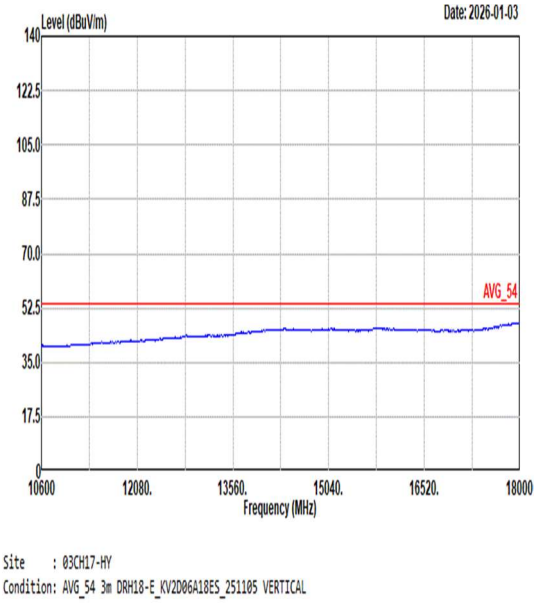
Mode	11	
	Harmonic	
	2400-2483.5_Bluetooth BR_GFSK_CH39_2441MHz	
ANT	7	
Pol.	Horizontal	Vertical
Peak Avg	 Site : 03CH17-HY Condition: PEAK_74 3m DRH18-E_KV2D06A18ES_251105 HORIZONTAL Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 4882.00 44.17 74.00 -29.83 36.43 32.43 12.27 37.72 0.76 -- -- Peak 2 4882.00 19.38 54.00 -34.62 -- -- -- -- -- -- -- Average 3 7323.00 50.09 74.00 -23.91 35.69 37.00 15.40 38.92 0.92 -- -- Peak 4 7323.00 25.30 54.00 -28.70 -- -- -- -- -- -- -- Average	 Site : 03CH17-HY Condition: PEAK_74 3m DRH18-E_KV2D06A18ES_251105 VERTICAL Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 4882.00 44.88 74.00 -29.12 37.14 32.43 12.27 37.72 0.76 -- -- Peak 2 4882.00 20.09 54.00 -33.91 -- -- -- -- -- -- -- Average 3 7323.00 49.83 74.00 -24.17 35.43 37.00 15.40 38.92 0.92 -- -- Peak 4 7323.00 25.04 54.00 -28.96 -- -- -- -- -- -- -- Average

Mode	11	
	Harmonic	
	2400-2483.5_Bluetooth BR_GFSK_CH39_2441MHz	
ANT	7	
Pol.	Horizontal	Vertical
10.6G ~18G Avg		

Mode	12	
	Band Edge	
	2400-2483.5_Bluetooth BR_GFSK_CH78_2480MHz	
ANT	7	
Pol.	Horizontal	Fundamental
Peak	 Site : 03CH17-HY Condition: PEAK_BE_74 3m DRH18-E_KV2D06A18ES_251105 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 2483.52 42.57 74.00 -31.43 44.63 26.70 7.82 36.58 0.00 100 268 Peak 2 2483.52 17.78 54.00 -36.22 -- -- -- -- -- -- -- AVERAGE	 Site : 03CH17-HY Condition: PEAK_74 3m DRH18-E_KV2D06A18ES_251105 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 2480.00 100.21 ------ ------ 102.27 26.70 7.82 36.58 0.00 100 268 Peak 2 2480.00 75.42 ------ ------ -- -- -- -- -- -- -- Average

Mode	12	
	Band Edge	
	2400-2483.5_Bluetooth BR_GFSK_CH78_2480MHz	
ANT	7	
Pol.	Vertical	Fundamental
Peak	 Site : 03CH17-HY Condition: PEAK_BE_74 3m DRH18-E_KV2D06A18ES_251105 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 2484.50 39.41 74.00 -34.59 41.47 26.70 7.82 36.58 0.00 100 320 Peak 2 2484.50 14.62 54.00 -39.38 -- -- -- -- -- -- -- AVERAGE	 Site : 03CH17-HY Condition: PEAK_74 3m DRH18-E_KV2D06A18ES_251105 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 2480.00 93.88 ------ ------ 95.94 26.70 7.82 36.58 0.00 100 320 Peak 2 2480.00 69.09 ------ ------ -- -- -- -- -- -- -- Average

Mode	12	
	Harmonic	
	2400-2483.5_Bluetooth BR_GFSK_CH78_2480MHz	
ANT	7	
Pol.	Horizontal	Vertical
Peak Avg	 Site : 03CH17-HY Condition: PEAK_74 3m DRH18-E_KV2D06A18ES_251105 HORIZONTAL Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 4960.00 44.64 74.00 -29.36 36.86 32.72 12.12 37.75 0.69 -- -- Peak 2 4960.00 19.85 54.00 -34.15 -- -- -- -- -- -- -- Average 3 7440.00 49.29 74.00 -24.71 34.79 37.02 15.62 39.07 0.93 -- -- Peak 4 7440.00 24.50 54.00 -29.50 -- -- -- -- -- -- -- Average	 Site : 03CH17-HY Condition: PEAK_74 3m DRH18-E_KV2D06A18ES_251105 VERTICAL Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 4960.00 44.88 74.00 -29.12 37.10 32.72 12.12 37.75 0.69 -- -- Peak 2 4960.00 20.09 54.00 -33.91 -- -- -- -- -- -- -- Average 3 7440.00 49.10 74.00 -24.90 34.60 37.02 15.62 39.07 0.93 -- -- Peak 4 7440.00 24.31 54.00 -29.69 -- -- -- -- -- -- -- Average

Mode	12	
	Harmonic	
	2400-2483.5_Bluetooth BR_GFSK_CH78_2480MHz	
ANT	7	
Pol.	Horizontal	Vertical
10.6G ~18G Avg		

Appendix D. Duty Cycle Plots

<Ant.0>

3DH5 on time (One Pulse) Plot on Channel 78	on time (Count Pulses) Plot on Channel 78

Note:

1. Worst case Duty cycle = on time/100 milliseconds = 2 * 2.88 / 100 = 5.76 %
2. Worst case Duty cycle correction factor = 20*log(Duty cycle) = -24.79 dB
3. **3DH5** has the highest duty cycle worst case and is reported.

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

2.88 ms x 20 channels = 57.6 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 / 57.6 ms] = 2 hops

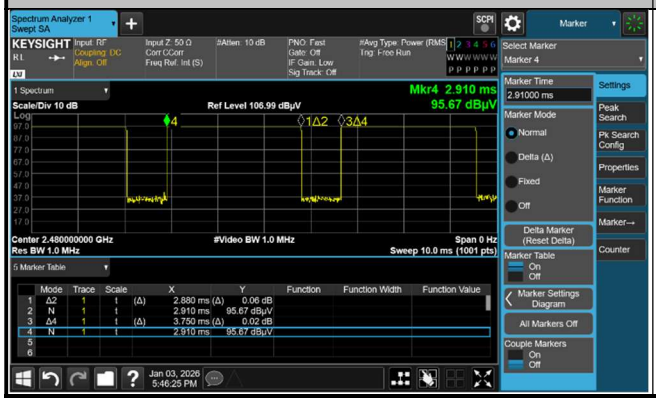
Thus, the maximum possible ON time:

2.88 ms x 2 = 5.76 ms

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

20 x log(5.76 ms/100 ms) = -24.79 dB

<Ant.1>

3DH5 on time (One Pulse) Plot on Channel 78	on time (Count Pulses) Plot on Channel 78
	

Note:

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