



Appendix C. Radiated Spurious Emission Plots

Test Engineer :	Jacky Hung, Andy Yang and CR Liao	Temperature :	20~25°C
		Relative Humidity :	50~60%

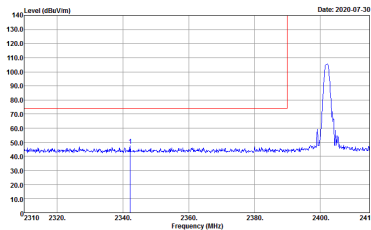
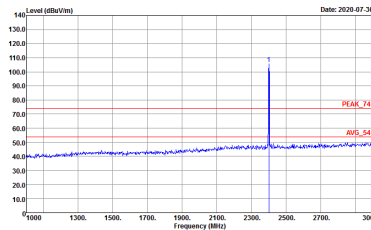
Note symbol

-L	Low channel location
-R	High channel location

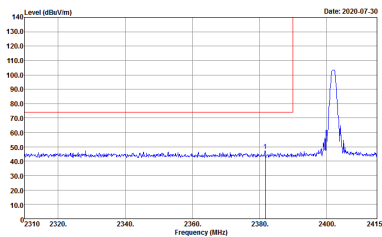
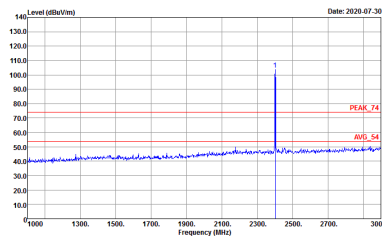


2.4GHz 2400~2483.5MHz

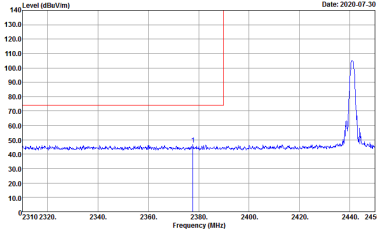
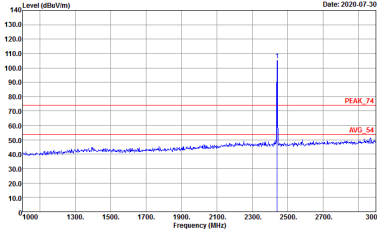
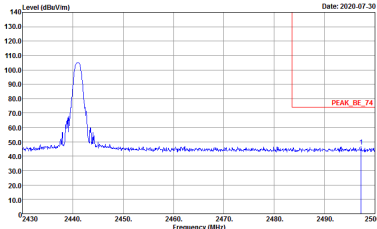
BT (Band Edge @ 3m)

BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BT CH00 2402MHz	
	Horizontal	Fundamental
Peak	 Site : 03CH16-HY Condition : PEAK_BE_74 3m 91200_1522 HORIZONTAL Detector : RBW:1000.0000Hz VBW:3000.0000Hz SWT:Auto Project : 070601	 Site : 03CH16-HY Condition : PEAK_74 3m 91200_1522 HORIZONTAL Detector : RBW:1000.0000Hz VBW:3000.0000Hz SWT:Auto Project : 070601

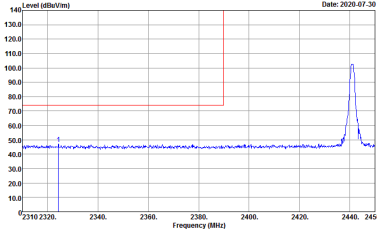
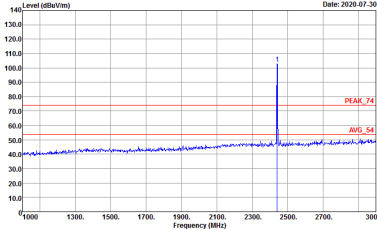
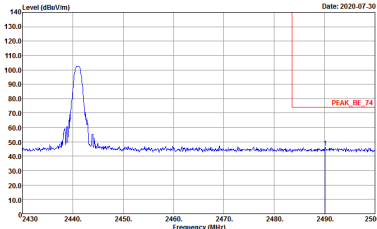


BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BT CH00 2402MHz	
	Vertical	Fundamental
Peak	 Site : 03CH16-11Y Condition : PEAK_BE_74 3m 91200_1522 VERTICAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Project : Peak Project : 070601	 Site : 03CH16-11Y Condition : PEAK_74 3m 91200_1522 VERTICAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Project : Peak Project : 070601



BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BT CH39 2441MHz	
	Horizontal	Fundamental
Peak	 Site : 03CH16-HY Condition : PEAK_BE_74 3m 91200_1522 HORIZONTAL Detector : Peak Project : 070601	 Site : 03CH16-HY Condition : PEAK_74 3m 91200_1522 HORIZONTAL Detector : Peak Project : 070601
Peak	 Site : 03CH16-HY Condition : PEAK_BE_74 3m 91200_1522 HORIZONTAL Detector : Peak Project : 070601	Left blank



BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BT CH39 2441MHz	
	Vertical	Fundamental
Peak	 Site : 03CH16-HY Condition : PEAK_BE_74 3m 91200_1522 VERTICAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Project : Peak Project : 070601	 Site : 03CH16-HY Condition : PEAK_74 3m 91200_1522 VERTICAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Project : Peak Project : 070601
Peak	 Site : 03CH16-HY Condition : PEAK_BE_74 3m 91200_1522 VERTICAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Project : Peak Project : 070601	Left blank



BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BT CH78 2480MHz	
	Horizontal	Fundamental
Peak	Level (dBuV/m) Date: 2020-07-30 2460 2463.2465 2467 2469 2471 2473 2475 2477 2479 2481 2483 2485 2487 2489 2491 2493 2495 2497 2500 Frequency (MHz) Site : 03CH16-11Y Condition : PEAK_BE_74 3m 91200_1522 HORIZONTAL Detector : Peak Project : 070601	Level (dBuV/m) Date: 2020-07-30 1000 1300 1500 1700 1900 2100 2300 2500 2700 3000 Frequency (MHz) Site : 03CH16-11Y Condition : PEAK_74 3m 91200_1522 HORIZONTAL Detector : Peak Project : 070601

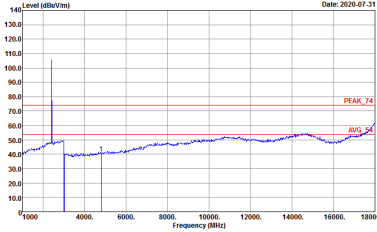
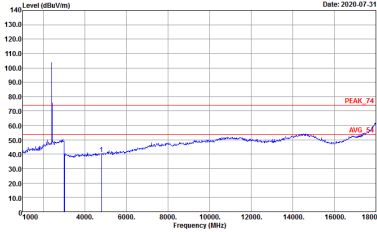


BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BT CH78 2480MHz	
	Vertical	Fundamental
Peak	Level (dBm/Vm) Date: 2020-07-30 2460 2463.2465 2467 2469 2471 2473 2475 2477 2479 2481 2483 2485 2487 2489 2491 2493 2495 2497 2500 Frequency (MHz) Site : 03CH16-11Y Condition : PEAK_BE_74 3m 91200_1522 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 070601	Level (dBm/Vm) Date: 2020-07-30 1000 1300 1500 1700 1900 2100 2300 2500 2700 2900 3000 Frequency (MHz) Site : 03CH16-11Y Condition : PEAK_74 3m 91200_1522 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 070601



2.4GHz 2400~2483.5MHz

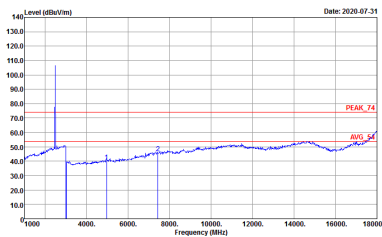
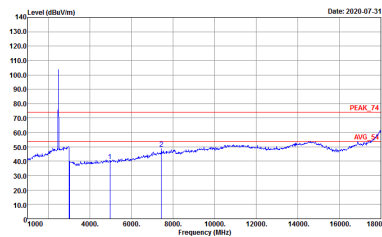
BT (Harmonic @ 3m)

BT	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	BT CH00 2402MHz	
	Horizontal	Vertical
Peak Avg.	 Site : 03CH16-HY Condition : PEAK_74 3m 91200_1522 HORIZONTAL Detector : Peak Project : 070601	 Site : 03CH16-HY Condition : PEAK_74 3m 91200_1522 VERTICAL Detector : Peak Project : 070601



BT	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	BT CH39 2441MHz	
	Horizontal	Vertical
Peak Avg.	Level (dBuV/m) Date: 2020-07-31 Site : 03CH16-11Y Condition : PEAK_74 3m 91200_1522 HORIZONTAL Detector : Peak Project : 070601	Level (dBuV/m) Date: 2020-07-31 Site : 03CH16-11Y Condition : PEAK_74 3m 91200_1522 VERTICAL Detector : Peak Project : 070601

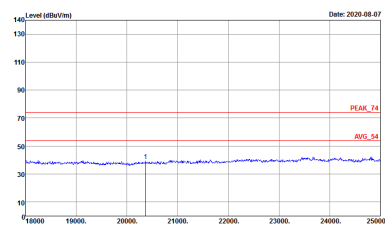
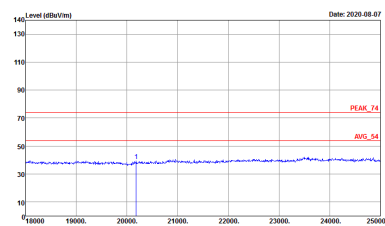


BT	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	BT CH78 2480MHz	
	Horizontal	Vertical
Peak Avg.	 Site : 03CH16-11Y Condition : PEAK_74 3m 91200_1522 HORIZONTAL Detector : Peak Project : 070601	 Site : 03CH16-11Y Condition : PEAK_74 3m 91200_1522 VERTICAL Detector : Peak Project : 070601

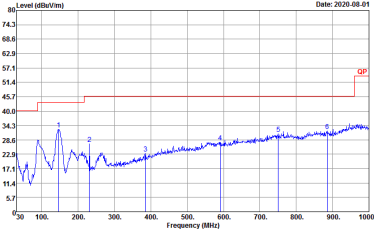
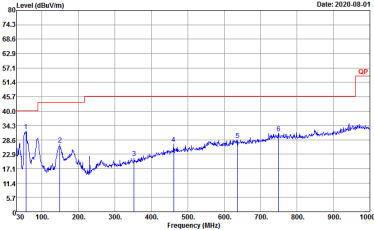


Emission above 18GHz

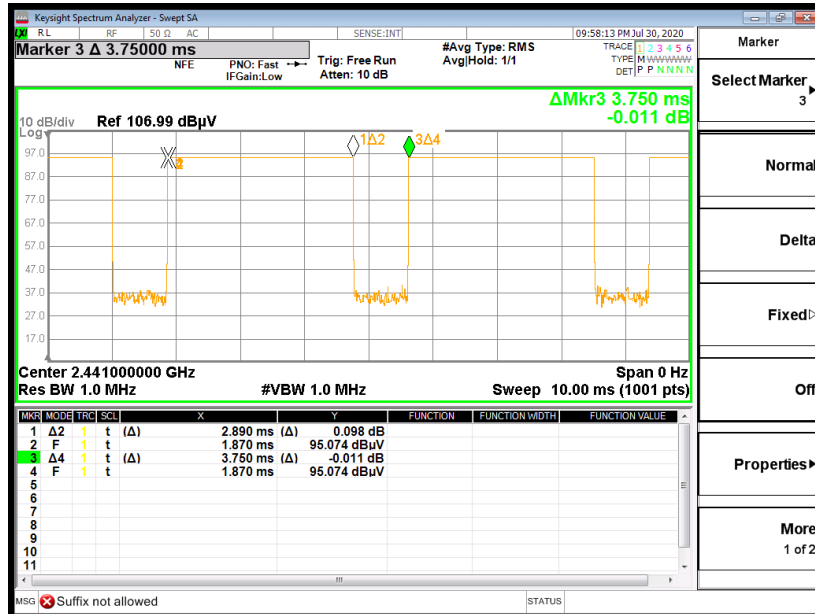
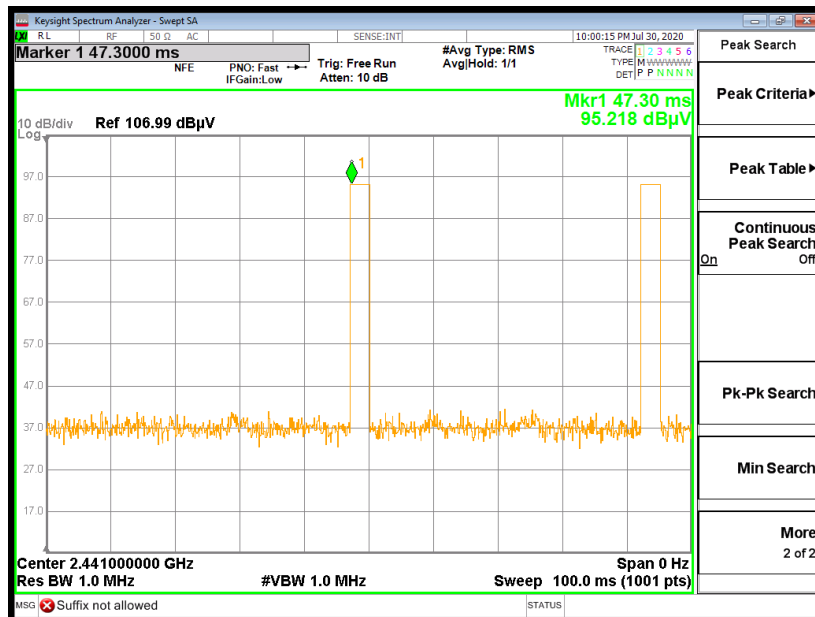
2.4GHz BT (SHF)

BT	2.4GHz 2400~2483.5MHz	
	BT SHF	
	Horizontal	Vertical
QP / Peak	 Site : 03CH16-HY Condition : PEAK_74 1m SHF HORN 88HA9170584 HORIZONTAL Detector : Peak Project : 070601	 Site : 03CH16-HY Condition : PEAK_74 1m SHF HORN 88HA9170584 VERTICAL Detector : Peak Project : 070601

Emission below 1GHz
2.4GHz BT (LF)

BT	2.4GHz 2400~2483.5MHz	
	BT LF	
	Horizontal	Vertical
QP / Peak	 Site : 03CH16-HY Condition : QP 3m BIL06_47020606 HORIZONTAL Detector : Peak Project : 070601	 Site : 03CH16-HY Condition : QP 3m BIL06_47020606 VERTICAL Detector : Peak Project : 070601

Appendix D. Duty Cycle Plots

DH5 on time (One Pulse) Plot on Channel 39

on time (Count Pulses) Plot on Channel 39

Note:

1. Worst case Duty cycle = on time/100 milliseconds = $2 * 2.89 / 100 = 5.78 \%$
2. Worst case Duty cycle correction factor = $20 * \log(\text{Duty cycle}) = -24.76 \text{ dB}$
3. DH5 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 period to have DH5 packet completing one hopping sequence is

$$2.89 \text{ ms} \times 20 \text{ channels} = 57.8 \text{ ms}$$

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. $[100 \text{ ms} / 57.8 \text{ ms}] = 2 \text{ hops}$

Thus, the maximum possible ON time:

$$2.89 \text{ ms} \times 2 = 5.78 \text{ ms}$$

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

$$20 \times \log(5.78 \text{ ms}/100 \text{ ms}) = -24.76 \text{ dB}$$