Appendix D. Radiated Spurious Emission Plots

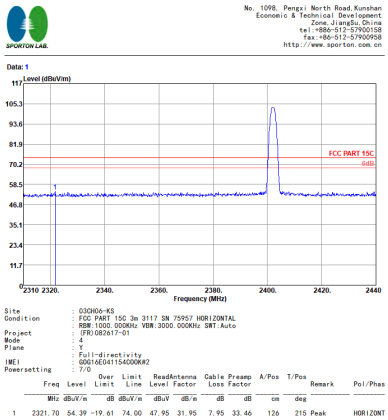
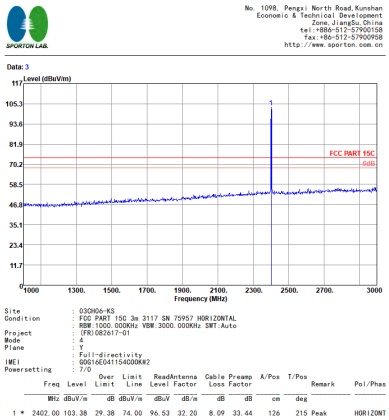
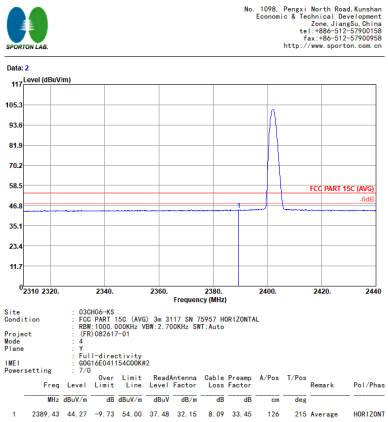
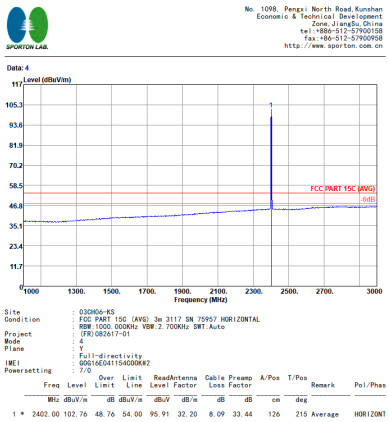
Note symbol

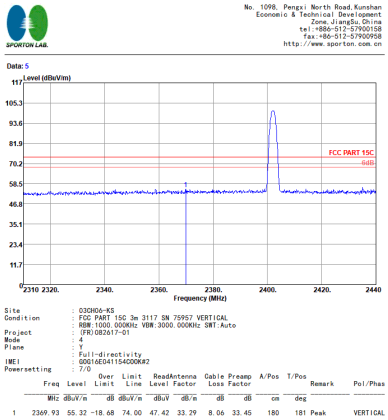
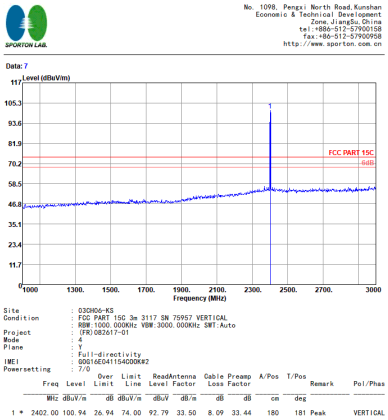
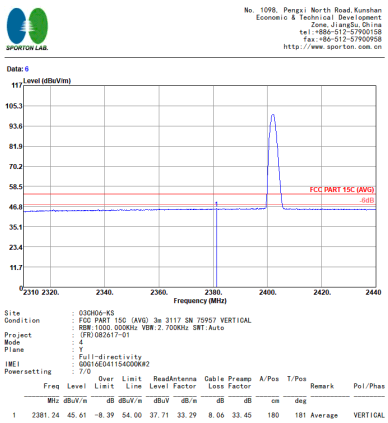
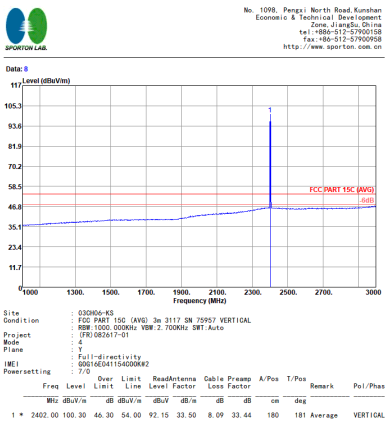
-L	**Low channel location**
-R	**High channel location**

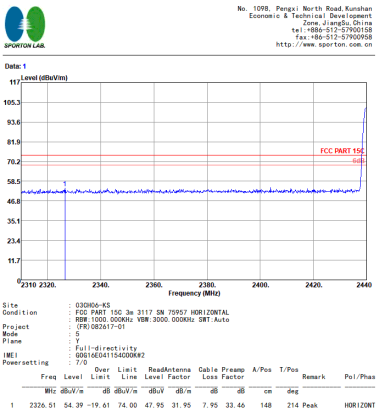
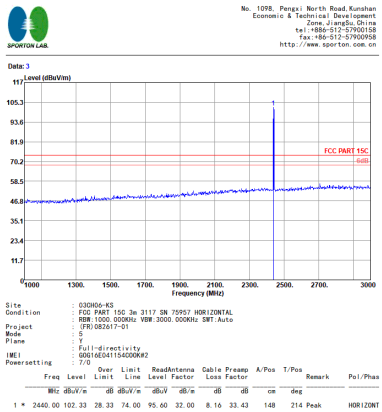
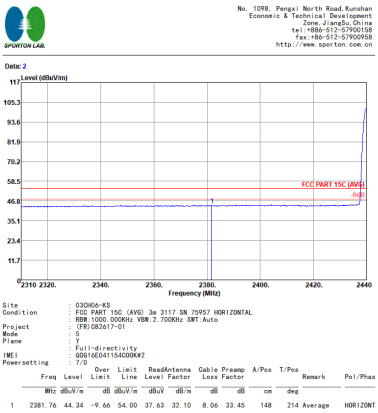
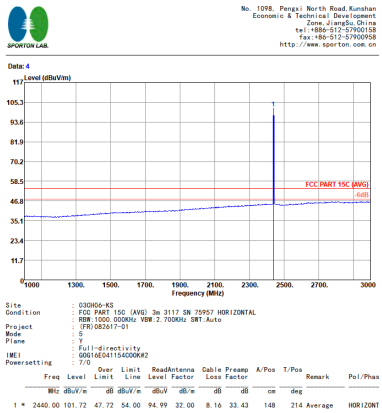
Bluetooth LE 1Mbps

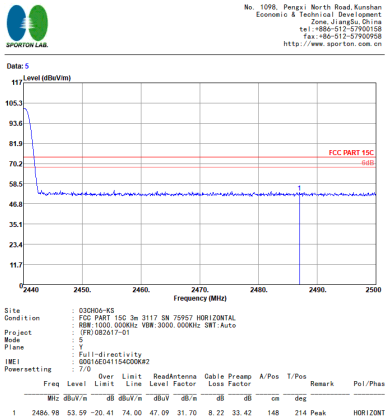
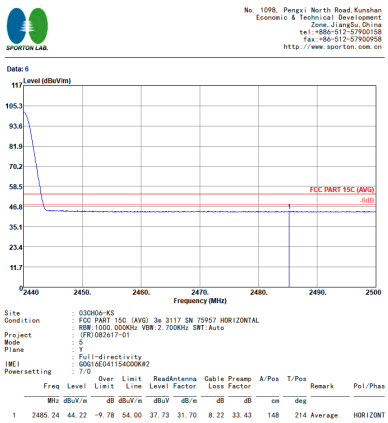
2.4GHz 2400~2483.5MHz

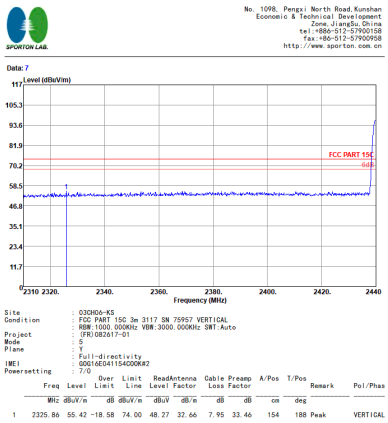
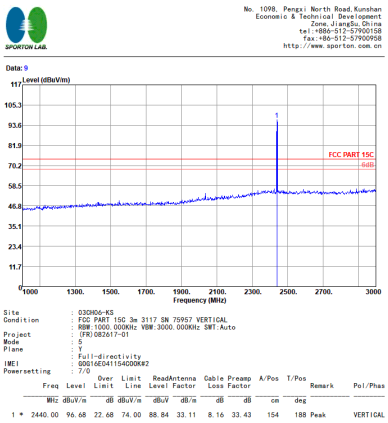
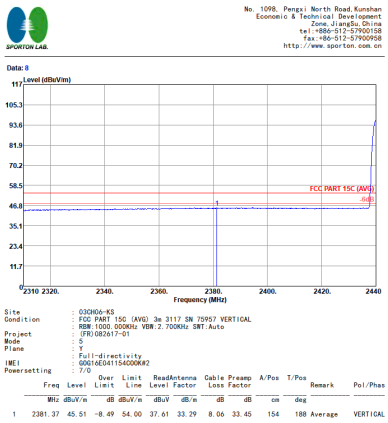
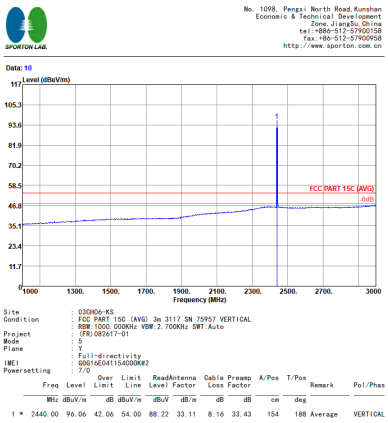
BLE (Band Edge @ 3m)

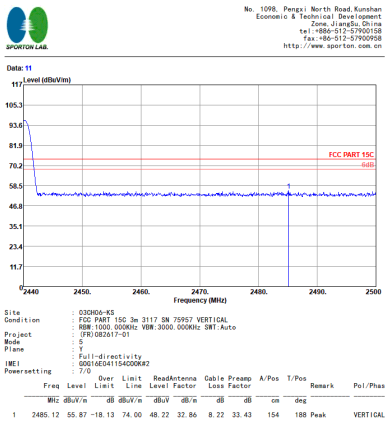
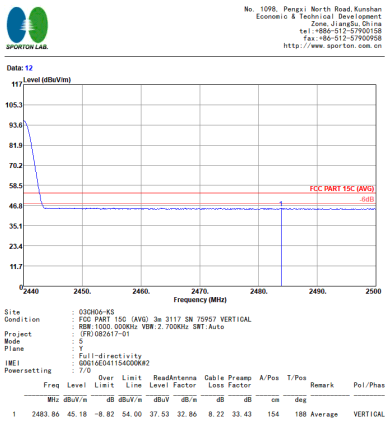
BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH00 2402MHz	
	Horizontal	Fundamental
Peak		
Avg.		

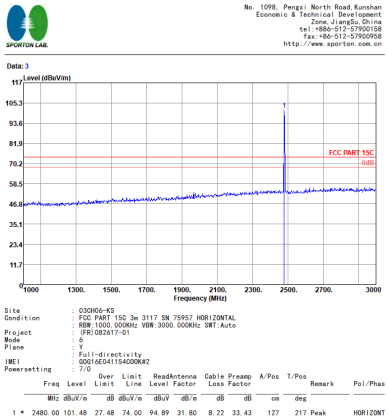
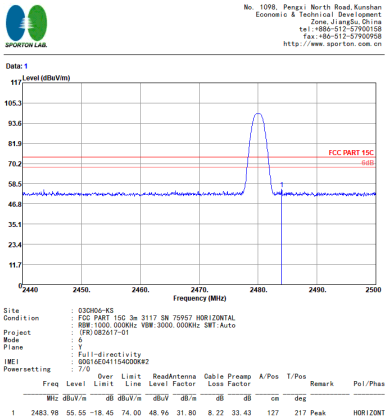
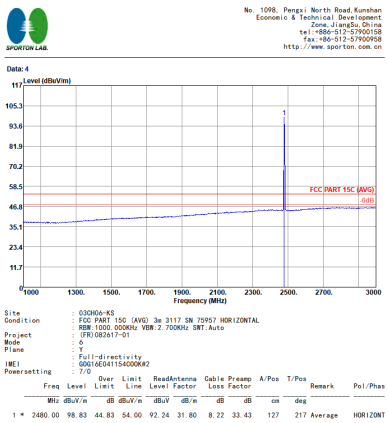
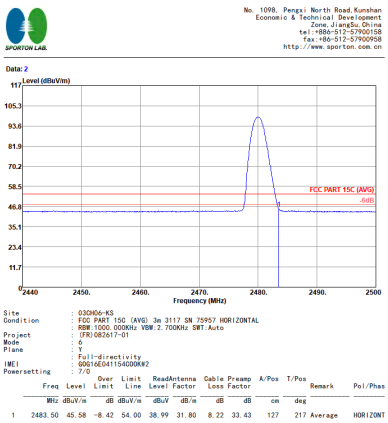
BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH00 2402MHz	
	Vertical	Fundamental
Peak		
Avg		

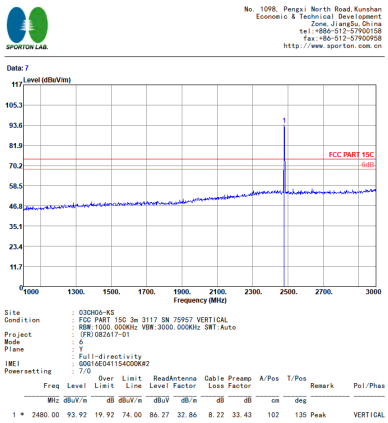
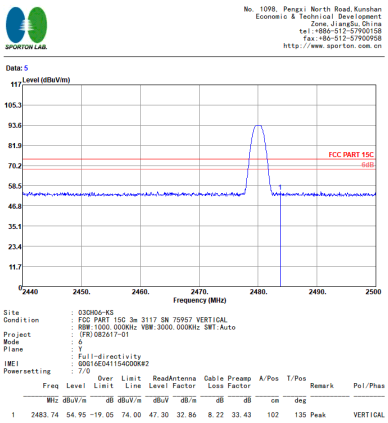
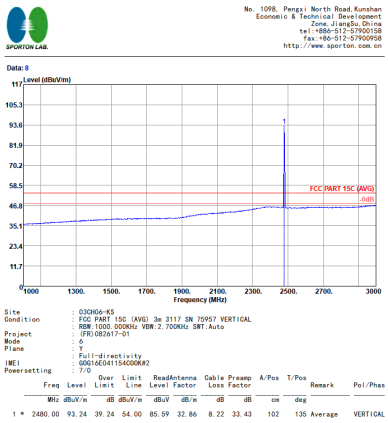
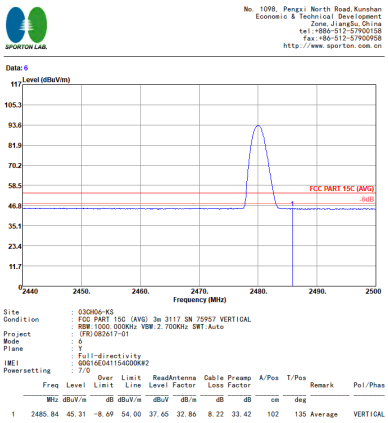
BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH19 2440MHz - L	
	Horizontal	Fundamental
Peak		
Avg.		

BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH19 2440MHz - R	
	Horizontal	Fundamental
Peak		-
Avg.		-

BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH19 2440MHz - L	
	Vertical	Fundamental
Peak		
Avg.		

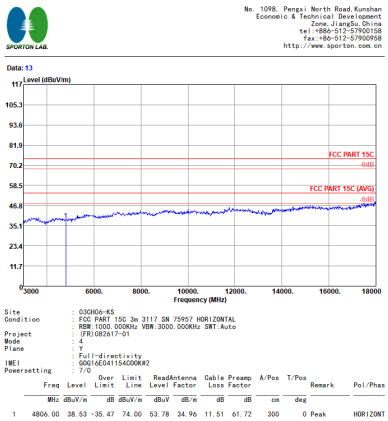
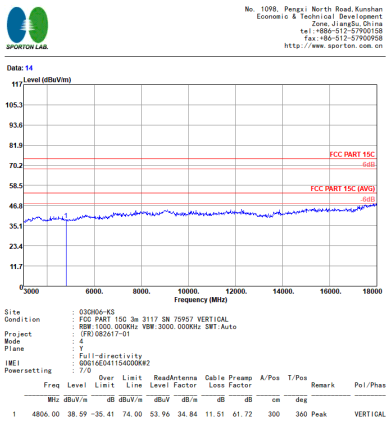
BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH19 2440MHz - R	
	Vertical	Fundamental
Peak		-
Avg.		-

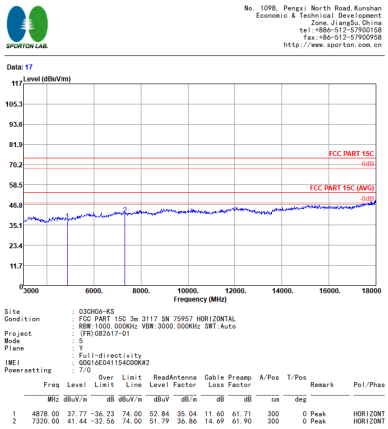
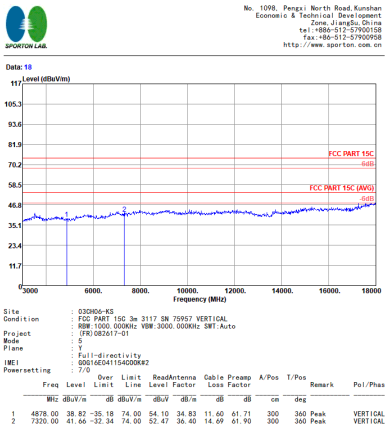
BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH39 2480MHz	
	Horizontal	Fundamental
Peak		
Avg.		

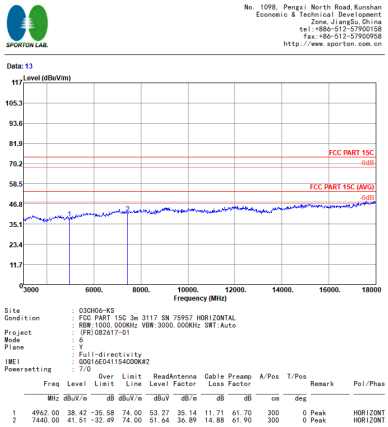
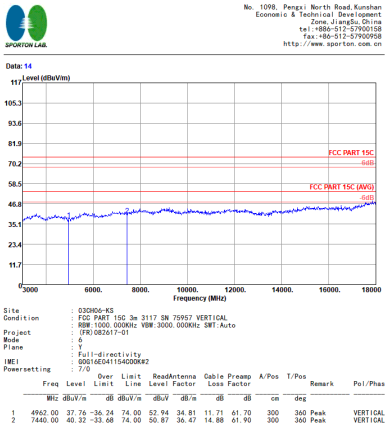
BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH39 2480MHz	
	Vertical	Fundamental
Peak		
Avg.		

2.4GHz 2400~2483.5MHz

BLE (Harmonic @ 3m)

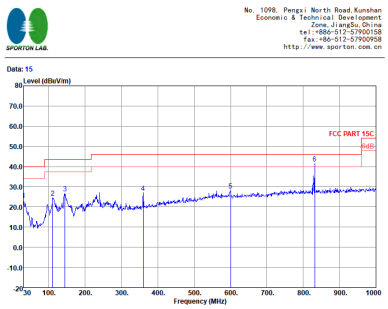
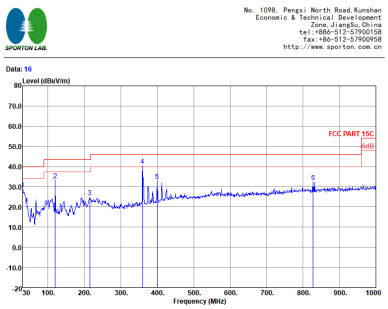
BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	BLE CH00 2402MHz	
	Horizontal	Vertical
Peak Avg.		

BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	BLE CH19 2440MHz	
	Horizontal	Vertical
Peak Avg.		

BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	BLE CH39 2480MHz	
	Horizontal	Vertical
Peak		

Emission below 1GHz

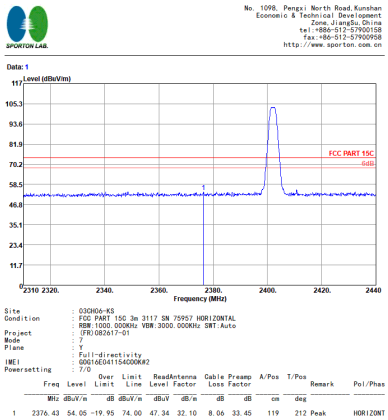
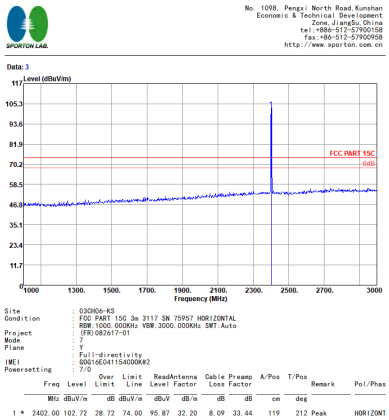
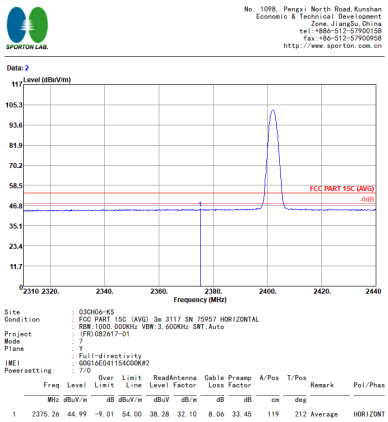
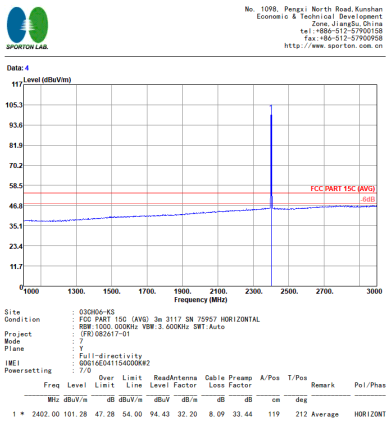
2.4GHz BLE (LF)

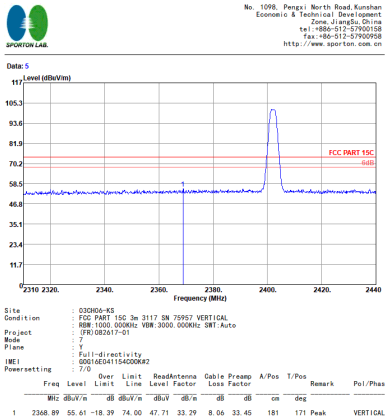
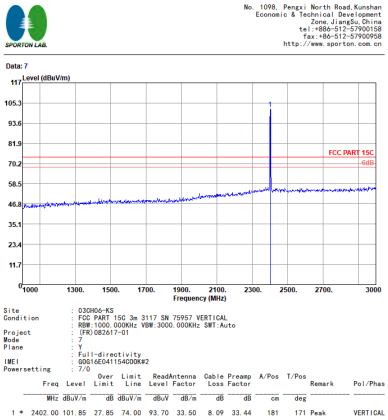
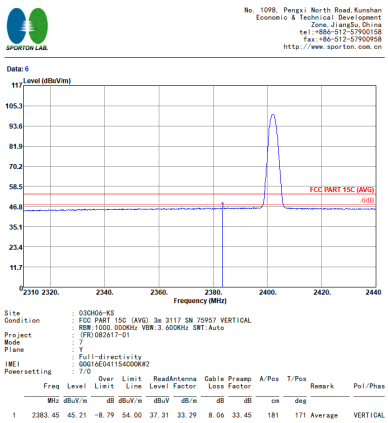
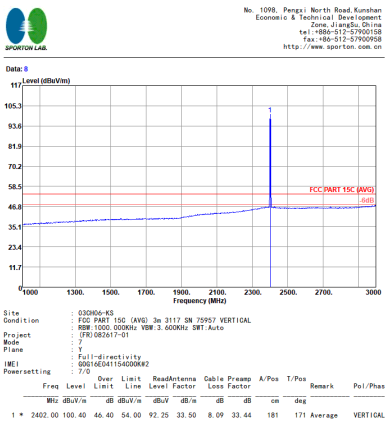
BLE	2.4GHz 2400~2483.5MHz	
	BLE LF	
	Horizontal	Vertical
QP / Peak	 Site : 03CH06-KS Condition : FCC PART 15C 3m CBL6112D SN23188 HORIZONTAL RBW:100.000KHz VBW:300.000KHz SWT:Auto Project : (FR)082617-01 Mode : 1 Plane : Y : Full-directivity IMEI : 000160E041154C00K#2 Over Limit ReadAntenna Cable Preamp A/Pos T/Pos Freq Level Limit Line Level Factor Loss Factor Remark Pol/Phas MHz dBuV/m dB dBuV/m dBuV dB/m dB dB cm deg 1 30.00 23.41 -16.59 40.00 30.53 25.00 0.58 32.70 --- --- Peak HORIZONT 2 110.51 24.46 -19.04 43.50 38.58 17.05 1.71 32.88 --- --- Peak HORIZONT 3 144.46 26.85 -16.65 43.50 41.15 16.58 1.93 32.81 --- --- Peak HORIZONT 4 359.80 27.21 -18.79 46.00 36.24 20.77 3.08 32.88 --- --- Peak HORIZONT 5 600.36 28.09 -17.91 46.00 31.70 24.90 3.99 32.50 --- --- Peak HORIZONT 6 ! 831.22 41.47 -4.53 46.00 42.98 26.35 4.70 32.56 152 75 Peak HORIZONT	 Site : 03CH06-KS Condition : FCC PART 15C 3m CBL6112D SN23188 VERTICAL RBW:100.000KHz VBW:300.000KHz SWT:Auto Project : (FR)082617-01 Mode : 1 Plane : Y : Full-directivity IMEI : 000160E041154C00K#2 Over Limit ReadAntenna Cable Preamp A/Pos T/Pos Freq Level Limit Line Level Factor Loss Factor Remark Pol/Phas MHz dBuV/m dB dBuV/m dBuV dB/m dB dB cm deg 1 30.00 28.87 -11.13 40.00 35.49 25.50 0.58 32.70 --- --- Peak VERTICAL 2 120.21 33.20 -10.30 43.50 46.42 17.86 1.78 32.86 --- --- Peak VERTICAL 3 214.30 24.82 -18.68 43.50 38.36 17.19 2.37 33.10 --- --- Peak VERTICAL 4 ! 359.80 40.36 -5.64 46.00 48.51 21.65 3.08 32.88 125 40 Peak VERTICAL 5 399.57 33.02 -12.98 46.00 39.86 22.70 3.26 32.80 --- --- Peak VERTICAL 6 827.34 32.24 -13.76 46.00 33.05 27.06 4.68 32.55 --- --- Peak VERTICAL	

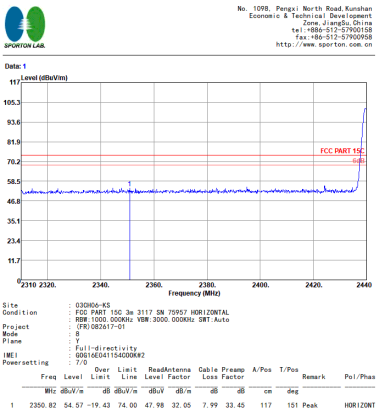
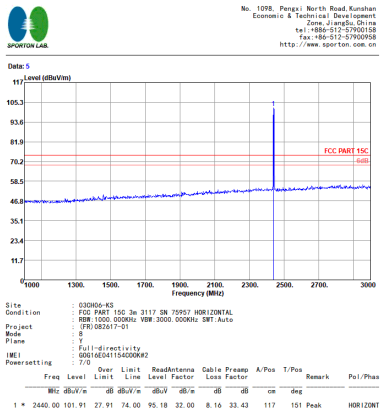
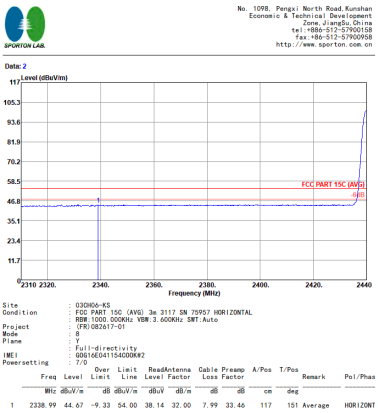
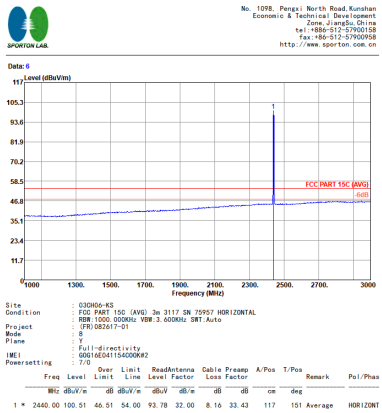
Bluetooth LE 2Mbps

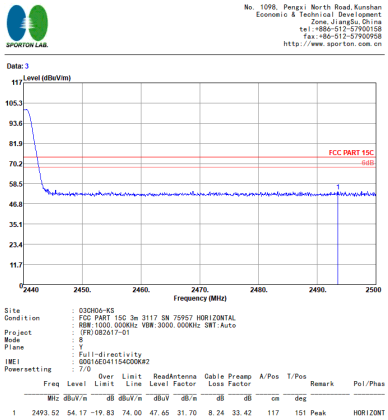
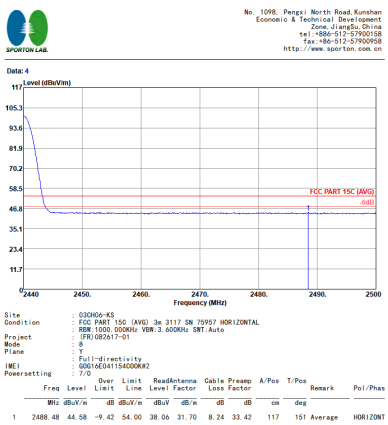
2.4GHz 2400~2483.5MHz

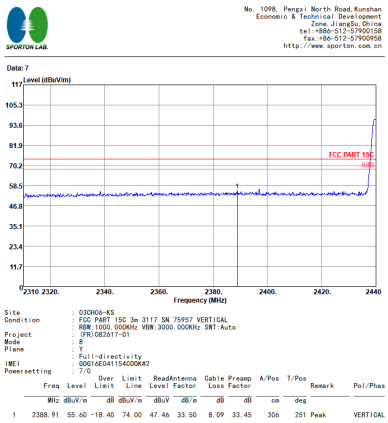
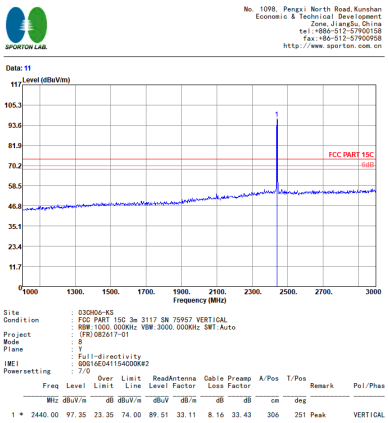
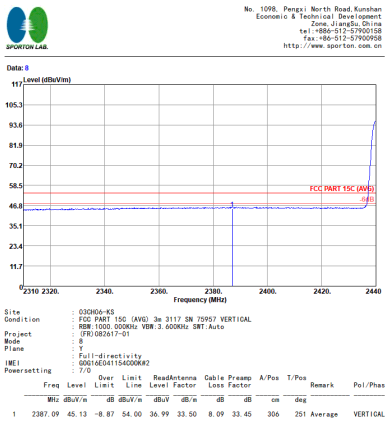
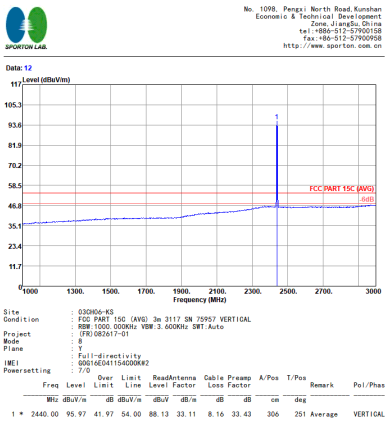
BLE (Band Edge @ 3m)

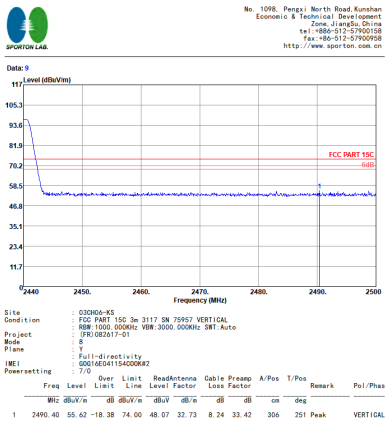
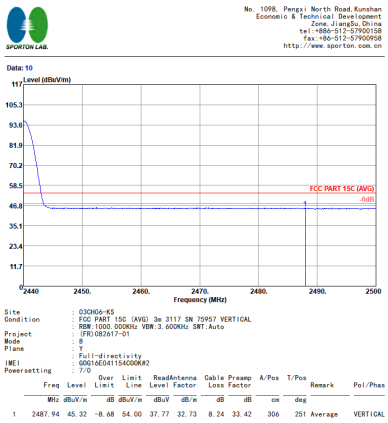
BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH00 2402MHz	
	Horizontal	Fundamental
Peak		
Avg.		

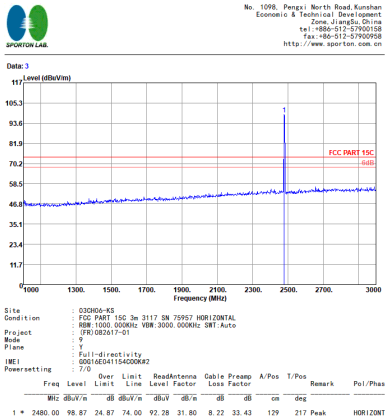
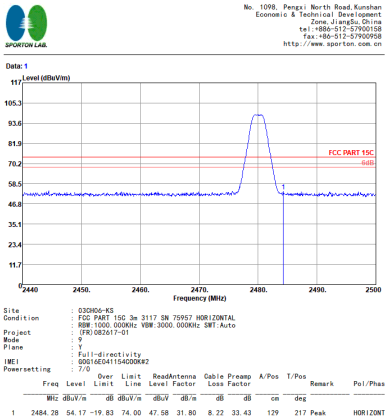
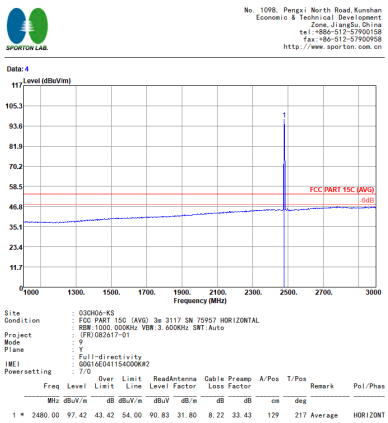
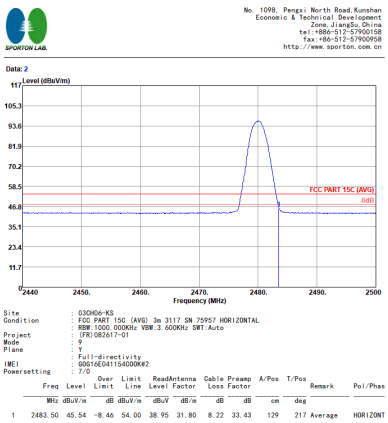
BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH00 2402MHz	
	Vertical	Fundamental
Peak		
Avg		

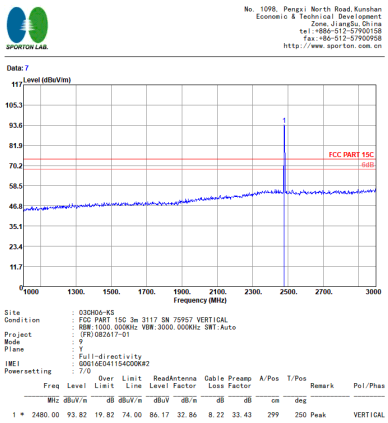
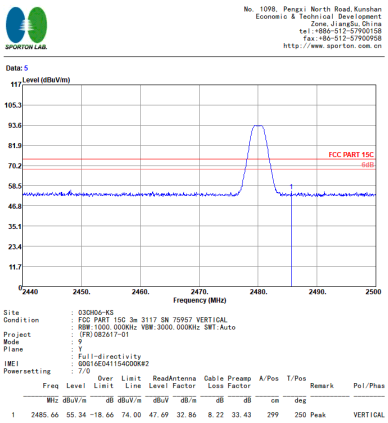
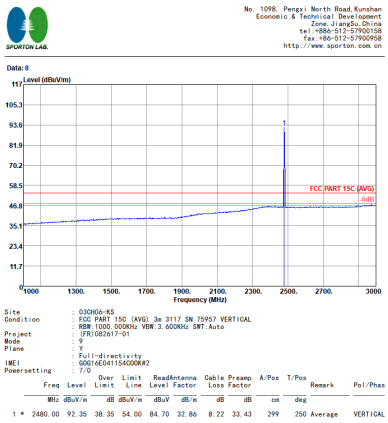
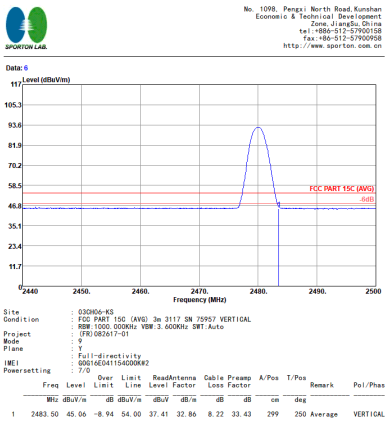
BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH19 2440MHz - L	
	Horizontal	Fundamental
Peak		
Avg.		

BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH19 2440MHz - R	
	Horizontal	Fundamental
Peak		-
Avg.		-

BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH19 2440MHz - L	
	Vertical	Fundamental
Peak		
Avg.		

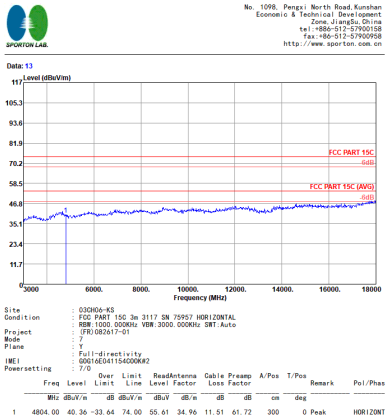
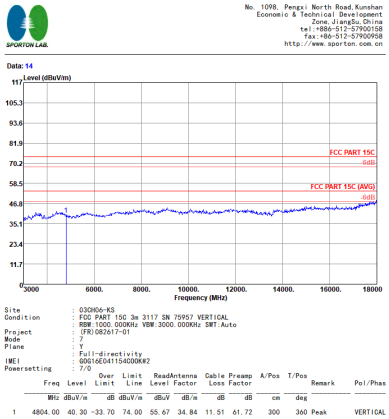
BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH19 2440MHz - R	
	Vertical	Fundamental
Peak		-
Avg.		-

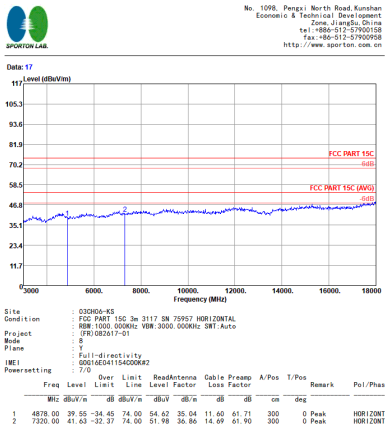
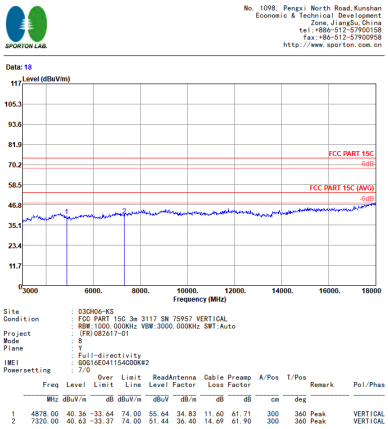
BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH39 2480MHz	
	Horizontal	Fundamental
Peak		
Avg.		

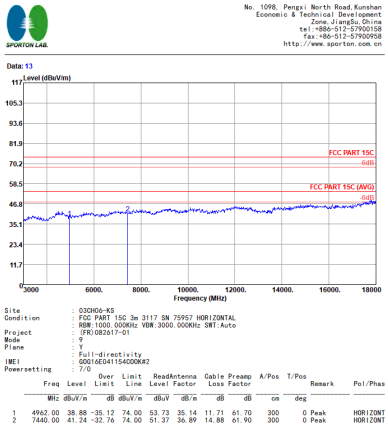
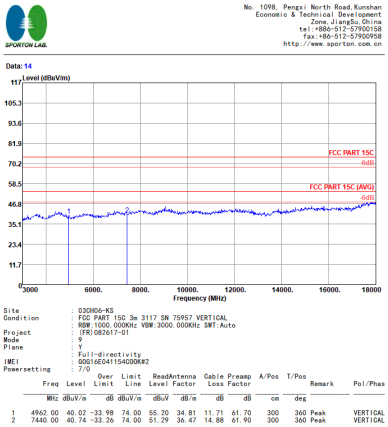
BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH39 2480MHz	
	Vertical	Fundamental
Peak		
Avg.		

2.4GHz 2400~2483.5MHz

BLE (Harmonic @ 3m)

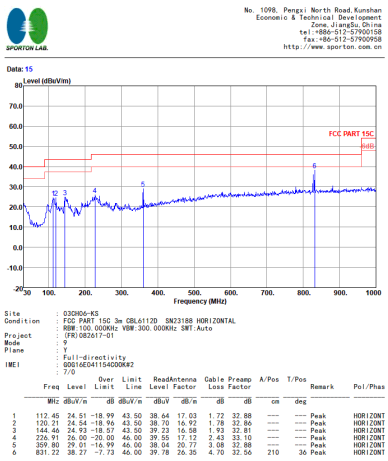
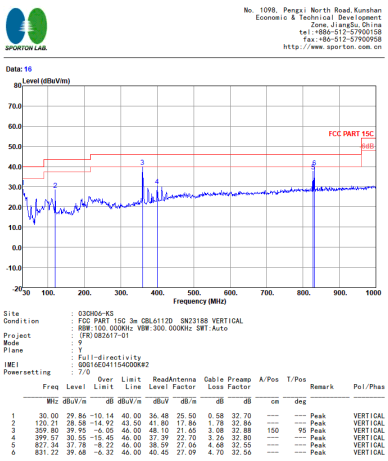
BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	BLE CH00 2402MHz	
	Horizontal	Vertical
Peak Avg.		

BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	BLE CH19 2440MHz	
	Horizontal	Vertical
Peak Avg.	 No. 1098, Pengxi North Road,Kunshan Economic & Technical Development Zone,JiangSu,China tel:+86-512-57900158 fax:+86-512-57900958 http://www.sporton.com.cn Data: 17 Level (dBuV/m) 117 105.3 93.6 81.9 70.2 58.5 46.8 35.1 23.4 11.7 0 FCC PART 15C 6dB FCC PART 15C (AVG) 6dB 3000 6000. 8000. 10000. 12000. 14000. 16000. 18000 Frequency (MHz) Site : O3CH06-KS Condition : FCC PART 15C 3m 3117 SN 75957 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Project : (FR)082617-01 Mode : 8 Plane : Y : Full-directivity IMEI : 000165D41154000K#2 Powersetting : 7/0 Freq Level Over Limit Limit Line Level Factor ReadAntenna Cable Loss Factor Preamp Factor A/Pos T/Pos Remark Pol/Phas MHz dBuV/m dB dBuV/m dBuV dB/m dB dB cm deg 1 4878.00 39.55 -34.45 74.00 54.62 35.04 11.60 61.71 300 0 Peak HORIZONT 2 7320.00 41.63 -32.37 74.00 51.98 36.86 14.69 61.90 300 0 Peak HORIZONT	 No. 1098, Pengxi North Road,Kunshan Economic & Technical Development Zone,JiangSu,China tel:+86-512-57900158 fax:+86-512-57900958 http://www.sporton.com.cn Data: 18 Level (dBuV/m) 117 105.3 93.6 81.9 70.2 58.5 46.8 35.1 23.4 11.7 0 FCC PART 15C 6dB FCC PART 15C (AVG) 6dB 3000 6000. 8000. 10000. 12000. 14000. 16000. 18000 Frequency (MHz) Site : O3CH06-KS Condition : FCC PART 15C 3m 3117 SN 75957 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Project : (FR)082617-01 Mode : 8 Plane : Y : Full-directivity IMEI : 000165D41154000K#2 Powersetting : 7/0 Freq Level Over Limit Limit Line Level Factor ReadAntenna Cable Loss Factor Preamp Factor A/Pos T/Pos Remark Pol/Phas MHz dBuV/m dB dBuV/m dBuV dB/m dB dB cm deg 1 4878.00 40.36 -33.64 74.00 55.64 34.83 11.60 61.71 300 360 Peak VERTICAL 2 7320.00 40.63 -33.37 74.00 51.44 36.40 14.69 61.90 300 360 Peak VERTICAL

BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	BLE CH39 2480MHz	
	Horizontal	Vertical
Peak	 No. 1098, Pengxi North Road,Kunshan Economic & Technical Development Zone,JiangSu,China tel:+886-512-57900158 fax:+86-512-57900958 http://www.sporton.com.cn Data: 13 Level (dBuV/m) 117 105.3 93.6 81.9 70.2 58.5 46.8 35.1 23.4 11.7 0 FCC PART 15C 6dB FCC PART 15C (AVG) 6dB 3000 6000. 8000. 10000. 12000. 14000. 16000. 18000 Frequency (MHz) Site : 03CH06-KS Condition : FCC PART 15C 3m 3117 SN 75957 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Project : (FR)082617-01 Mode : 9 Plane : Y : Full-directivity IMEI : 000160E041154C00K#2 Powersetting : 7/0 Freq Level Over Limit Limit Line ReadAntenna Level Factor Cable Loss Factor Preamp Factor A/Pos T/Pos Remark Pol/Phas MHz dBuV/m dB dBuV/m dBuV dB/m dB dB cm deg 1 4962.00 38.88 -35.12 74.00 53.73 35.14 11.71 61.70 300 0 Peak HORIZONT 2 7440.00 41.24 -32.76 74.00 51.37 36.89 14.88 61.90 300 0 Peak HORIZONT	 No. 1098, Pengxi North Road,Kunshan Economic & Technical Development Zone,JiangSu,China tel:+886-512-57900158 fax:+86-512-57900958 http://www.sporton.com.cn Data: 14 Level (dBuV/m) 117 105.3 93.6 81.9 70.2 58.5 46.8 35.1 23.4 11.7 0 FCC PART 15C 6dB FCC PART 15C (AVG) 6dB 3000 6000. 8000. 10000. 12000. 14000. 16000. 18000 Frequency (MHz) Site : 03CH06-KS Condition : FCC PART 15C 3m 3117 SN 75957 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Project : (FR)082617-01 Mode : 9 Plane : Y : Full-directivity IMEI : 000160E041154C00K#2 Powersetting : 7/0 Freq Level Over Limit Limit Line ReadAntenna Level Factor Cable Loss Factor Preamp Factor A/Pos T/Pos Remark Pol/Phas MHz dBuV/m dB dBuV/m dBuV dB/m dB dB cm deg 1 4962.00 40.02 -33.98 74.00 55.20 34.81 11.71 61.70 300 360 Peak VERTICAL 2 7440.00 40.74 -33.26 74.00 51.29 36.47 14.88 61.90 300 360 Peak VERTICAL

Emission below 1GHz

2.4GHz BLE (LF)

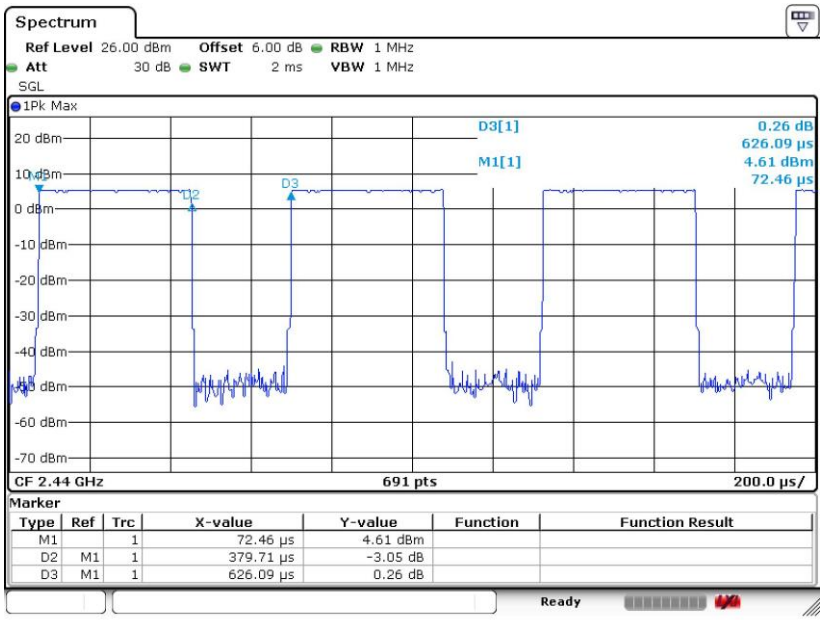
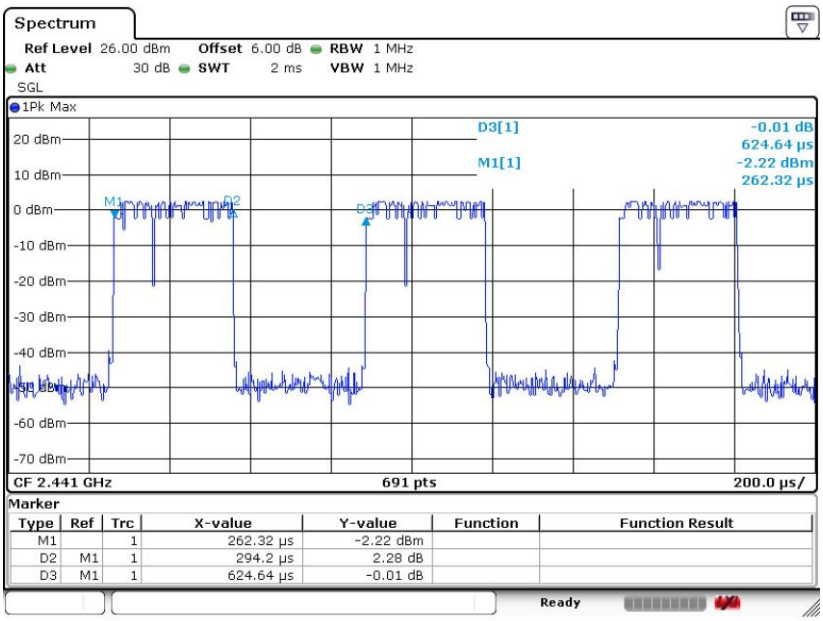
BLE	2.4GHz 2400~2483.5MHz	
	BLE LF	
	Horizontal	Vertical
QP / Peak	 Site : 03CH06-KS Condition : FCC PART 15C 3m CBL6112D SN23188 HORIZONTAL : RBW:100.000KHz VBW:300.000KHz SWT:Auto Project : (FR)GB2617-01 Mode : 7 Plane : Y : Full-directivity IMEI : GG016E041154C00K#2 : 7/0 Data: 15 Level (dBuV/m) FCC PART 15C -6dB Frequency (MHz) Freq Level Over Limit Limit Line ReadAntenna Level Factor Cable Loss Preamp Factor A/Pos T/Pos Remark Pol/Phas MHz dBuV/m dB dBuV/m dBuV dB/m dB dB cm deg 1 112.45 24.51 -18.99 43.50 38.64 17.03 1.72 32.88 --- --- Peak HORIZONT 2 120.21 24.54 -18.96 43.50 38.70 16.92 1.78 32.86 --- --- Peak HORIZONT 3 144.46 24.93 -18.57 43.50 39.23 16.58 1.93 32.81 --- --- Peak HORIZONT 4 226.91 26.00 -20.00 46.00 39.55 17.12 2.43 33.10 --- --- Peak HORIZONT 5 359.80 29.01 -16.99 46.00 38.04 20.77 3.08 32.88 --- --- Peak HORIZONT 6 831.22 38.27 -7.73 46.00 39.78 26.35 4.70 32.56 210 36 Peak HORIZONT	 Site : 03CH06-KS Condition : FCC PART 15C 3m CBL6112D SN23188 VERTICAL : RBW:100.000KHz VBW:300.000KHz SWT:Auto Project : (FR)GB2617-01 Mode : 7 Plane : Y : Full-directivity IMEI : GG016E041154C00K#2 Powersetting : 7/0 Data: 16 Level (dBuV/m) FCC PART 15C -6dB Frequency (MHz) Freq Level Over Limit Limit Line ReadAntenna Level Factor Cable Loss Preamp Factor A/Pos T/Pos Remark Pol/Phas MHz dBuV/m dB dBuV/m dBuV dB/m dB dB cm deg 1 30.00 29.86 -10.14 40.00 36.48 25.50 0.58 32.70 --- --- Peak VERTICAL 2 120.21 28.58 -14.92 43.50 41.80 17.86 1.78 32.86 --- --- Peak VERTICAL 3 359.80 39.95 -6.05 46.00 48.10 21.65 3.08 32.88 150 95 Peak VERTICAL 4 399.57 30.55 -15.45 46.00 37.39 22.70 3.26 32.80 --- --- Peak VERTICAL 5 827.34 37.78 -8.22 46.00 38.59 27.06 4.68 32.55 --- --- Peak VERTICAL 6 831.22 39.68 -6.32 46.00 40.45 27.09 4.70 32.56 --- --- Peak VERTICAL

Note: For above testing, we have also tested from 18GHz to 25GHz and found no emissions.

Appendix E. Duty Cycle Plots

Band	Duty Cycle(%)	T(ms)	Duty Factor(dB)	1/T(kHz)	VBW Setting
Bluetooth LE 1Mbps	60.65	0.37971	2.17	2.634	2.7KHz
Bluetooth LE 2Mbps	47.10	0.2942	3.27	3.399	3.6KHz

Bluetooth LE 1Mbps



Bluetooth LE 2Mbps