Spot Check Evaluation

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1190

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REVISION HISTORY

VERSION	DESCRIPTION	ISSUED DATE
Rev. 01	Initial issue of report	Mar. 07, 2017
Rev. 02	Revising the NII B1-3 test data and plot of radiation band edge.	Mar. 16, 2017

1. Introduction Section

The original model (FCC ID: PY7-08618V) and the variant model (FCC ID: PY7-10720X) has identical PCB layout, antenna, SW implementation for Bluetooth/Wi-Fi/NFC/GPS. Based on their similarity, the FCC Part 15C (equipment class: DTS, DSS, DXX) and Part 15E (equipment class: NII) test data issued test data of PY7-10720X references the test data of PY7-08618V

The applicant takes full responsibility that the test data as referenced in this report represent compliance for this FCC ID (FCC ID: PY7-10720X).

2. Difference Section

The original model (FCC ID: PY7-08618V) and the variant model (FCC ID: PY7-10720X) has identical PCB layout, antenna, SW implementation for Bluetooth/Wi-Fi/NFC/GPS. The details of similarity and difference can be found in the Operating Description.

Cellular transmitter RF components are different in PY7-10720X, to support capability for different cellular bands.

The product specification is outlined in the following table:

FCC ID			PY7-08618V	PY7-10720X
Wireless Tech	**Mode**		**Frequency (MHz)**	
GSM	GSM Voice GPRS (GMSK) EDGE (8PSK)	Multi-Slot Class 12 DTM: No	850/1900	850/1900
UMTS	AMR/RCM12.2Kbps HSDPA/HSUPA/DC-HSDPA		B5/B2	B5/B2/B4
LTE (FDD)	QPSK 16QAM		B5/B2/B7	B12/B17/B5/B2/B4/B7
Wi-Fi	11b/11g/11n(HT20)		2412-2462	
	11a/11n(HT20)/11n(HT40)		5180-5240 5260-5320 5500-5720 5745-5825 *5600-5650 notched	
Bluetooth	V4.2 LE		2402-2480 MHz	
NFC	ASK		13.56 MHz	

3. Spot Check Verification Data Section

Summary of the spot check:

Test Item	Mode	PY7-08618V Worst Result	PY7-10720X Worst Result	Difference (dB)
Average Conducted Power (dBm)	802.11b	16.78	16.75	0.03
	802.11g	14.85	14.82	0.03
	11n HT20	11.49	11.33	0.16
	11n HT40	11.48	11.32	0.16
	BT (1Mbps)	7.62	7.58	0.04
	BT (2Mbps)	5.44	5.39	0.05
	BT (3Mbps)	5.45	5.42	0.03
	BT-LE	0.43	0.37	0.06
	11a, 5.2GHz	13.92	13.84	0.08
	11n HT20, 5.2GHz	12.88	12.76	0.12
	11n HT40, 5.2GHz	12.77	12.75	0.02
	11a, 5.3GHz	13.89	13.82	0.07
	11n HT20, 5.3GHz	12.98	12.75	0.23
	11n HT40, 5.3GHz	12.70	12.68	0.02
	11a, 5.5GHz	13.77	13.72	0.05
	11n HT20, 5.5GHz	12.74	12.71	0.03
	11n HT40, 5.5GHz	12.84	12.70	0.14
	11a, 5.8GHz	13.82	13.60	0.22
	11n HT20, 5.8GHz	12.84	12.83	0.01
	11n HT40, 5.8GHz	12.97	12.81	0.16
	S/N of test sample	0123456789ABCDEF	WUJ01NNQSW	
	Test date	2017/1/3~2017/1/10	2017/01/12~2017/01/21	
Peak Radiated Spurious Emission (Band Edge) (dBuV/m)	802.11b	57.10	57.44	-0.34
	802.11g	66.07	63.16	2.91
	BT (1Mbps)	56.86	57.12	-0.26
	BT-LE	56.47	56.91	-0.44
	11n HT40, 5.2GHz	63.88	64.13	-0.25
	11n HT40, 5.3GHz	61.98	63.45	-1.47
	11n HT40, 5.5GHz	64.52	64.45	0.07
	11a, 5.8GHz	63.12	61.52	1.6
	S/N of test sample	WUJ01NNJAG	WUJ01NNWFD	
	Test date	2017/1/12~2017/1/16	2017/01/16~2017/02/11	
Average Radiated Spurious Emission (Band Edge) (dBuV/m)	802.11b	45.03	44.67	0.36
	802.11g	49.49	47.07	2.42
	BT (1Mbps)	32.07	32.29	-0.22
	BT-LE	45.67	45.71	-0.24
	11n HT40, 5.2GHz	50.33	50.79	-0.46
	11n HT40, 5.3GHz	50.59	50.64	-0.05
	S/N of test sample	WUJ01NNJAG	WUJ01NNWFD	
	Test date	2017/1/2~2017/1/16	2017/01/16~2017/02/11	

Peak Radiated Spurious Emission (Harmonic) (dBuV/m)	802.11b	52.88	52.79	0.09
	802.11g	51.03	48.28	2.75
	BT (1Mbps)	44.53	44.76	-0.23
	BT-LE	43.7	42.81	0.89
	11n HT40, 5.2GHz	46.52	47.19	-0.67
	11n HT40, 5.3GHz	47.72	46.84	0.88
	11n HT40, 5.5GHz	46.56	46.61	-0.05
	11a, 5.8GHz	58.7	55.83	2.87
	S/N of test sample	WUJ01NNJAG	WUJ01NNWFD	
	Test date	2017/1/12~2017/1/16	2017/01/16~2017/02/11	
NFC (dBuV/m)	RSE (9kHz to 30MHz)	38.69	37.52	1.17
	S/N of test sample	WUJ01NNPBW	WUJ01NNQN2	
	Test date	2017/1/18~2017/1/19	2017/01/18	

Conclusion:

Radiated spurious emission test against the variant model for non-cellular part based on the worst-case condition from the original model was performed in this filing to demonstrate the test data from original model remains representative for the variant model.

Based on the spot check test result (power levels measured are within 0.5dB, and the worst case of RSE spot check verification based on the worst condition from the original model is within 3dB, and are compliance with the limits), the test data from the original model is representative for the variant model.

The unwanted, harmonics, radiated spurious emission is reported peak measurement only due to spurious lower than 20dB than the limit, 74dBuv/m, without further reporting the average measurement

The detail test results can be found in this document, Appendix A, hereafter.

4. Reference detail Section

Rule Part	Equipment Class	Wireless Technology	Frequency Band (MHz)	Reference FCC ID	Type Grant/Permissive Change	Reference Report Title	Reference Application	Reference Report Sections
15C	DTS	Bluetooth – LE Wii-Fi	2400~2483.5	PY7-08618V	Original Grant	FCC RF Test Report	PY7-10720X	Part 15C (FR6D2925B, FR6D2925C)
	DSS	Bluetooth	2400~2483.5	PY7-08618V	Original Grant	FCC RF Test Report	PY7-10720X	Part 15C (FR6D2925A)
	DXX	NFC	13.56	PY7-08618V	Original Grant	FCC RF Test Report	PY7-10720X	Part 15C (FR6D2925D)
15E	NII	Wi-Fi	5150~5250 5250~5350 5470~5725 5725~5850	PY7-08618V	Original Grant	FCC RF Test Report	PY7-10720X	Part 15E (FR6D2925E, FR6D2925F, FZ6D2925)

Appendix A. Spot Check Test Result

1.1 Conducted power

<2.4GHz WLAN>

	Mode	Channel	Frequency (MHz)	Data Rate	Tune-Up Limit	FCC ID PY7-08618V Average power (dBm)	FCC ID PY7-10720X Average power (dBm)
2.4GHz WLAN	802.11b	CH 1	2412	1Mbps	17	16.39	16.30
		CH 6	2437			16.78	16.75
		CH 11	2462			16.27	16.20
	802.11g	CH 1	2412	6Mbps	15	14.36	14.27
		CH 6	2437			14.85	14.82
		CH 11	2462			14.75	14.52
	802.11n-HT20	CH 1	2412	MCS0	11.5	11.49	11.28
		CH 6	2437			11.43	11.33
		CH 11	2462			11.48	11.13
	802.11n-HT40	CH 3	2422	MCS0	11.5	11.19	11.06
		CH 6	2437			11.13	11.11
		CH 9	2452			11.48	11.32

<Bluetooth>

Mode	Channel	Frequency (MHz)	Tune-Up Limit	FCC ID PY7-08618V Average power (dBm)	FCC ID PY7-10720X Average power (dBm)
Bluetooth (1Mbps)	CH 00	2402	7	6.40	6.39
	CH 39	2441		7.62	7.58
	CH 78	2480		6.39	6.18
Bluetooth (2Mbps)	CH 00	2402	5	4.10	4.08
	CH 39	2441		5.44	5.39
	CH 78	2480		4.03	3.79
Bluetooth (3Mbps)	CH 00	2402	5	4.13	4.11
	CH 39	2441		5.45	5.42
	CH 78	2480		4.04	3.79
BLE (GFSK)	CH 00	2402	0	-0.96	-1.12
	CH 19	2440		0.43	0.37
	CH 39	2480		-1.31	-1.43

<5GHz WLAN>

	Mode	Channel	Frequency (MHz)	Data Rate	Tune-Up Limit	FCC ID PY7-08618V Average power (dBm)	FCC ID PY7-10720X Average power (dBm)
5.2GHz WLAN	802.11a	CH 36	5180	6Mbps	14	13.92	13.84
		CH 44	5220			13.79	13.72
		CH 48	5240			13.72	13.67
	802.11n-HT20	CH 36	5180	MCS0	13	12.88	12.76
		CH 44	5220			12.78	12.71
		CH 48	5240			12.86	12.69
	802.11n-HT40	CH 38	5190	MCS0	11.5	11.03	11.00
		CH 46	5230		13	12.77	12.75
	Mode	Channel	Frequency (MHz)	Data Rate	Tune-Up Limit	FCC ID PY7-08618V Average power (dBm)	FCC ID PY7-10720X Average power (dBm)
5.3GHz WLAN	802.11a	CH 52	5260	6Mbps	14	13.86	13.80
		CH 60	5300			13.87	13.77
		CH 64	5320			13.89	13.82
	802.11n-HT20	CH 52	5260	MCS0	13	12.96	12.71
		CH 60	5300			12.94	12.69
		CH 64	5320			12.98	12.75
	802.11n-HT40	CH 54	5270	MCS0	13	12.70	12.68
		CH 62	5310		10	9.84	9.55
	Mode	Channel	Frequency (MHz)	Data Rate	Tune-Up Limit	FCC ID PY7-08618V Average power (dBm)	FCC ID PY7-10720X Average power (dBm)
5.5GHz WLAN	802.11a	CH 100	5500	6Mbps	14	13.77	13.72
		CH 116	5580			13.72	13.67
		CH 140	5700			13.69	13.68
	802.11n-HT20	CH 100	5500	MCS0	13	12.74	12.71
		CH 116	5580			12.61	12.60
		CH 140	5700			12.62	12.60
	802.11n-HT40	CH 102	5510	MCS0	12	11.91	11.75
		CH 126	5630		13	12.84	12.70
		CH 134	5670			12.83	12.65

	Mode	Channel	Frequency (MHz)	Data Rate	Tune-Up Limit	FCC ID PY7-08618V Average power (dBm)	FCC ID PY7-10720X Average power (dBm)
5.8GHz WLAN	802.11a	CH 149	5745	MCS0	14	13.76	13.55
		CH 157	5785			13.74	13.53
		CH 165	5825			13.82	13.60
	802.11n-HT20	CH 149	5745	MCS0	13	12.84	12.83
		CH 157	5785			12.82	12.78
		CH 165	5825			12.71	12.68
	802.11n-HT40	CH 151	5755	MCS0	11	12.97	10.46
		CH 159	5795		13	12.96	12.81

1.2 Radiated Spurious Emission

2.4GHz BT/WLAN

Mode	Ch	Freq. (MHz)	Peak /Avg.	FCC ID PY7-08618V						FCC ID PY7-10720X					
				Band edge			Harmonic			Band edge			Harmonic		
				Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)
BT(1Mbps)	CH 78	2480	P	2491.24	56.86	74	7440	44.53	74	2489.4	57.12	74	7440	44.76	74
			A	2491.24	32.07	54	X	X	X	2489.4	32.29	54	X	X	X
BLE	CH 19	2440	P	2377.48	56.47	74	7320	43.7	74	2351.58	56.91	74	7320	42.81	74
			A	2499.58	45.67	54	X	X	X	2497.69	45.71	54	X	X	X
802.11b	CH 11	2462	P	2486.32	57.1	74	4924	52.88	74	2489.08	57.44	74	4924	52.79	74
			A	2486.36	45.03	54	X	X	X	2485.56	44.67	54	X	X	X
802.11g	CH 11	2462	P	2483.68	66.07	74	4924	51.03	74	2483.72	63.16	74	4924	48.28	74
			A	2483.52	49.49	54	X	X	X	2483.6	47.07	54	X	X	X

5.2GHz WLAN

Mode	Ch	Freq. (MHz)	Peak /Avg.	FCC ID PY7-08618V						FCC ID PY7-10720X					
				Band edge			Harmonic			Band edge			Harmonic		
				Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)
802.11n-HT40	CH 38	5190	P	5149.76	63.88	74	10380	46.52	68.2	5144.82	64.13	74	10380	47.19	68.2
			A	5148.98	50.33	54	X	X	X	5148.72	50.79	54	X	X	X

5.3GHz WLAN

Mode	Ch	Freq. (MHz)	Peak /Avg.	FCC ID PY7-08618V						FCC ID PY7-10720X					
				Band edge			Harmonic			Band edge			Harmonic		
				Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Frequency (MHz)	Level (dBuV/m)	Limit	Frequency (MHz)	Level (dBuV/m)	Limit
802.11n-HT40	CH 62	5310	P	5351.76	61.98	74	15930	47.72	74	5350.32	63.45	74	10620	46.84	74
			A	5350.08	50.59	54	X	X	X	5350.8	50.64	54	X	X	X

5.5GHz WLAN

Mode	Ch	Freq. (MHz)	Peak /Avg.	FCC ID PY7-08618V						FCC ID PY7-10720X					
				Band edge			Harmonic			Band edge			Harmonic		
				Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)
802.11n-HT40	CH 102	5510	P	5468.8	64.52	68.2	16530	46.56	68.2	5469.28	64.45	68.2	16530	46.61	68.2
			A	X	X	X	X	X	X	X	X	X	X	X	X

5.8GHz WLAN

Mode	Ch	Freq. (MHz)	Peak /Avg.	FCC ID PY7-08618V						FCC ID PY7-10720X					
				Band edge			Harmonic			Band edge			Harmonic		
				Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)
802.11a	CH 157	5785	P	5936.6	63.12	68.2	17355	58.7	68.2	5941	61.52	68.2	17355	55.83	68.2
			X	X	X	X	X	X	X	X	X	X	X	X	X

2.4GHz 2400~2483.5MHz

BLE (Band Edge @ 3m)

BLE	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
BLE CH 19 2440MHz		2351.58	56.91	-17.09	74	54.09	26.95	7.37	31.5	100	94	P	H
		2373.14	45.5	-8.5	54	42.6	27.02	7.37	31.49	100	94	A	H
	*	2440	96.51	-	-	93.28	27.22	7.49	31.48	100	94	P	H
	*	2440	94.99	-	-	91.76	27.22	7.49	31.48	100	94	A	H
		2497.2	55.83	-18.17	74	52.37	27.39	7.53	31.46	100	94	P	H
		2483.83	45.69	-8.31	54	42.28	27.35	7.53	31.47	100	94	A	H
		2313.78	55.52	-18.48	74	52.89	26.84	7.3	31.51	163	253	P	V
		2376.78	45.5	-8.5	54	42.59	27.03	7.37	31.49	163	253	A	V
	*	2440	91.06	-	-	87.83	27.22	7.49	31.48	163	253	P	V
	*	2440	89.93	-	-	86.7	27.22	7.49	31.48	163	253	A	V
		2490.27	55.84	-18.16	74	52.41	27.37	7.53	31.47	163	253	P	V
		2497.69	45.71	-8.29	54	42.25	27.39	7.53	31.46	163	253	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

BLE (Harmonic @ 3m)

BLE	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
BLE CH 19 2440MHz		4880	38.46	-35.54	74	53.39	32.28	10.89	58.1	100	0	P	H
		7320	42.81	-31.19	74	50.73	37	14.18	59.1	100	0	P	H
													H
													H
		4880	38.69	-35.31	74	53.62	32.28	10.89	58.1	100	0	P	V
		7320	42.75	-31.25	74	50.67	37	14.18	59.1	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

BT(1M) (Band Edge @ 3m)

BT (Band Edge @ 3m)

BT	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
BT CH 78 2480MHz	*	2480	102.03	-	-	98.63	27.34	7.53	31.47	168	102	P	H
	*	2480	77.2	-	-	-	-	-	-	-	-	A	H
		2489.4	57.12	-16.88	74	53.69	27.37	7.53	31.47	168	102	P	H
		2489.4	32.29	-21.71	54	-	-	-	-	-	-	A	H
													H
													H
	*	2480	101.38	-	-	97.98	27.34	7.53	31.47	379	57	P	V
	*	2480	76.55	-	-	-	-	-	-	-	-	A	V
		2490.52	55.9	-18.1	74	52.47	27.37	7.53	31.47	379	57	P	V
		2490.52	31.07	-22.93	54	-	-	-	-	-	-	A	V
													V
													V
Remark	3. No other spurious found. 4. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

BT (Harmonic @ 3m)

BT	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
BT CH 78 2480MHz		4960	42.59	-31.41	74	57	32.43	11.19	58.03	100	0	P	H
		4960	17.76	-36.24	54	-	-	-	-	-	-	A	H
		7440	44.76	-29.24	74	52.28	37.33	14.32	59.17	100	0	P	H
		7440	19.93	-34.07	54	-	-	-	-	-	-	A	H
		4960	41.21	-32.79	74	55.62	32.43	11.19	58.03	100	0	P	V
		4960	16.38	-37.62	54	-	-	-	-	-	-	A	V
		7440	43.65	-30.35	74	51.17	37.33	14.32	59.17	100	0	P	V
		7440	18.82	-35.18	54	-	-	-	-	-	-	A	V
Remark	3. No other spurious found. 4. All results are PASS against Peak and Average limit line.												

WIFI 802.11b (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11b CH 11 2462MHz	*	2462	106.18	-	-	102.83	27.29	7.53	31.47	360	57	P	H
	*	2462	101.54	-	-	98.19	27.29	7.53	31.47	360	57	A	H
		2489.08	57.44	-16.56	74	54.01	27.37	7.53	31.47	360	57	P	H
		2485.32	44.66	-9.34	54	41.24	27.36	7.53	31.47	360	57	A	H
													H
													H
	*	2462	105.89	-	-	102.54	27.29	7.53	31.47	100	119	P	V
	*	2462	101.26	-	-	97.91	27.29	7.53	31.47	100	119	A	V
		2494.12	56.57	-17.43	74	53.12	27.38	7.53	31.46	100	119	P	V
		2485.56	44.67	-9.33	54	41.25	27.36	7.53	31.47	100	119	A	V
													V
													V
Remark	5. No other spurious found. 6. All results are PASS against Peak and Average limit line.												

WIFI 802.11b (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11b CH 11 2462MHz		4924	52.79	-21.21	74	67.45	32.36	11.04	58.06	102	331	P	H
		4924	50.1	-3.9	54	64.76	32.36	11.04	58.06	102	331	A	H
		7386	44.47	-29.53	74	52.16	37.18	14.27	59.14	100	0	P	H
													H
		4924	52.04	-21.96	74	66.7	32.36	11.04	58.06	131	104	P	V
		4924	49.37	-4.63	54	64.03	32.36	11.04	58.06	131	104	A	V
		7386	42.95	-31.05	74	50.64	37.18	14.27	59.14	100	0	P	V
													V
Remark	5. No other spurious found. 6. All results are PASS against Peak and Average limit line.												

WIFI 802.11g (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 11 2462MHz	*	2462	104.32	-	-	100.97	27.29	7.53	31.47	364	55	P	H
	*	2462	95.06	-	-	91.71	27.29	7.53	31.47	364	55	A	H
		2483.6	60.23	-13.77	74	56.82	27.35	7.53	31.47	364	55	P	H
		2483.64	46.63	-7.37	54	43.22	27.35	7.53	31.47	364	55	A	H
													H
													H
	*	2462	105.78	-	-	102.43	27.29	7.53	31.47	100	78	P	V
	*	2462	95.57	-	-	92.22	27.29	7.53	31.47	100	78	A	V
		2483.72	63.16	-10.84	74	59.75	27.35	7.53	31.47	100	78	P	V
		2483.6	47.07	-6.93	54	43.66	27.35	7.53	31.47	100	78	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

WIFI 802.11g (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 11 2462MHz		4924	48.28	-25.72	74	62.94	32.36	11.04	58.06	100	0	P	H
		7386	43.69	-30.31	74	51.38	37.18	14.27	59.14	100	0	P	H
													H
													H
		4924	45.5	-28.5	74	60.16	32.36	11.04	58.06	100	0	P	V
		7386	43.58	-30.42	74	51.27	37.18	14.27	59.14	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 1 - 5150~5250MHz

WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT40 CH 38 5190MHz		5144.82	64.13	-9.87	74	51.4	32.47	11.21	30.95	106	181	P	H
		5148.72	50.79	-3.21	54	38.06	32.47	11.21	30.95	106	181	A	H
	*	5190	101.01	-	-	88.32	32.46	11.18	30.95	106	181	P	H
	*	5190	89.8	-	-	77.11	32.46	11.18	30.95	106	181	A	H
		5366.2	59.5	-14.5	74	46.5	32.43	11.52	30.95	106	181	P	H
		5455.24	49.28	-4.72	54	36.18	32.41	11.64	30.95	106	181	A	H
		5136.76	60.26	-13.74	74	47.5	32.47	11.24	30.95	355	117	P	V
		5148.46	49.16	-4.84	54	36.43	32.47	11.21	30.95	355	117	A	V
	*	5190	96.96	-	-	84.27	32.46	11.18	30.95	355	117	P	V
	*	5190	86.25	-	-	73.56	32.46	11.18	30.95	355	117	A	V
		5381.04	60.18	-13.82	74	47.11	32.42	11.6	30.95	355	117	P	V
		5395.6	49.62	-4.38	54	36.55	32.42	11.6	30.95	355	117	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		10380	46.13	-22.07	68.2	46.65	39.78	17.13	57.43	100	0	P	H
		15570	47.08	-26.92	74	44.61	39.29	21.64	58.46	100	0	P	H
802.11n													H
HT40													H
CH 38		10380	47.19	-21.01	68.2	47.71	39.78	17.13	57.43	100	0	P	V
5190MHz		15570	45.58	-28.42	74	43.11	39.29	21.64	58.46	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 2 - 5250~5350MHz

WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT40 CH 62 5310MHz		5058.14	59.77	-14.23	74	46.92	32.49	11.31	30.95	100	180	P	H
		5147.22	49.13	-4.87	54	36.4	32.47	11.21	30.95	100	180	A	H
	*	5310	98.37	-	-	85.45	32.44	11.43	30.95	100	180	P	H
	*	5310	87.57	-	-	74.65	32.44	11.43	30.95	100	180	A	H
		5350.32	63.45	-10.55	74	50.45	32.43	11.52	30.95	100	180	P	H
		5350.8	50.64	-3.36	54	37.64	32.43	11.52	30.95	100	180	A	H
		5096.56	59.62	-14.38	74	46.82	32.48	11.27	30.95	381	111	P	V
		5070.72	49.01	-4.99	54	36.2	32.49	11.27	30.95	381	111	A	V
	*	5310	95.18	-	-	82.26	32.44	11.43	30.95	381	111	P	V
	*	5310	84.26	-	-	71.34	32.44	11.43	30.95	381	111	A	V
		5454.24	60.04	-13.96	74	46.94	32.41	11.64	30.95	381	111	P	V
		5350.32	49.64	-4.36	54	36.64	32.43	11.52	30.95	381	111	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		10620	46.84	-27.16	74	46.57	40.05	17.4	57.18	100	0	P	H
		15930	44.93	-29.07	74	42.55	38.21	21.91	57.74	100	0	P	H
802.11n													H
HT40													H
CH 62		10620	46.45	-27.55	74	46.18	40.05	17.4	57.18	100	0	P	V
5310MHz		15930	45.03	-28.97	74	42.65	38.21	21.91	57.74	100	0	P	V
													V
													V

Remark

1. No other spurious found.
2. All results are PASS against Peak and Average limit line.

Band 3 - 5470~5725MHz

WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT40 CH 102 5510MHz		5386.48	59.66	-14.34	74	46.59	32.42	11.6	30.95	112	179	P	H
		5469.28	64.45	-3.75	68.2	51.32	32.41	11.67	30.95	112	179	P	H
		5459.92	49.77	-4.23	54	36.67	32.41	11.64	30.95	112	179	A	H
	*	5510	100.46	-	-	87.29	32.43	11.7	30.96	112	179	P	H
	*	5510	89.3	-	-	76.13	32.43	11.7	30.96	112	179	A	H
		5746.415	60.84	-7.36	68.2	46.92	33.09	11.86	31.03	112	179	P	H
		5352.88	59.57	-14.43	74	46.57	32.43	11.52	30.95	340	108	P	V
		5469.28	63	-5.2	68.2	49.87	32.41	11.67	30.95	340	108	P	V
		5459.92	49.77	-4.23	54	36.67	32.41	11.64	30.95	340	108	A	V
	*	5510	99.25	-	-	86.08	32.43	11.7	30.96	340	108	P	V
	*	5510	87.36	-	-	74.19	32.43	11.7	30.96	340	108	A	V
		5748.305	60.16	-8.04	68.2	46.23	33.1	11.86	31.03	340	108	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		11020	46.53	-27.47	74	45.59	40.2	17.86	57.12	100	0	P	H
		16530	46.61	-21.59	68.2	40.56	39.61	22.46	56.02	100	0	P	H
802.11n													H
HT40													H
CH 102		11020	47.49	-26.51	74	46.55	40.2	17.86	57.12	100	0	P	V
5510MHz		16530	46.52	-21.68	68.2	40.47	39.61	22.46	56.02	100	0	P	V
													V
													V

Remark

1. No other spurious found.
2. All results are PASS against Peak and Average limit line.

Band 4 - 5725~5850MHz

WIFI 802.11a (Band Edge @ 3m)

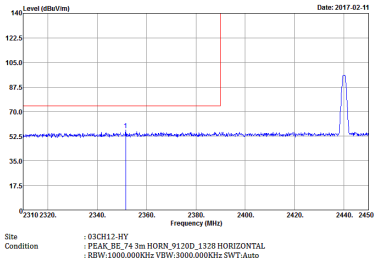
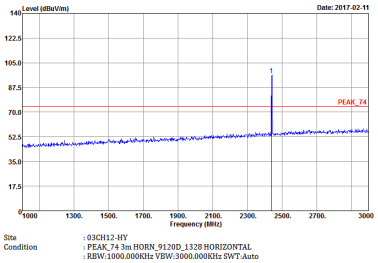
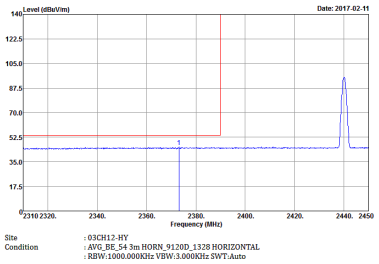
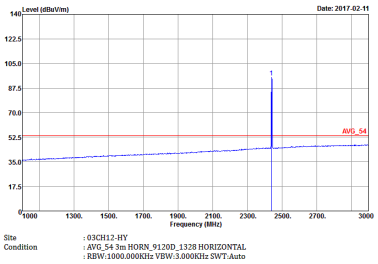
WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 157 5785MHz		5601.8	60.46	-7.74	68.2	46.98	32.69	11.77	30.98	100	189	P	H
		5696.6	60.54	-42.15	102.69	46.78	32.95	11.82	31.01	100	189	P	H
		5711	61.39	-46.89	108.28	47.58	32.99	11.84	31.02	100	189	P	H
		5724.6	60.91	-60.38	121.29	47.06	33.03	11.84	31.02	100	189	P	H
	*	5785	107.78	-	-	93.75	33.2	11.88	31.05	100	189	P	H
	*	5785	97.21	-	-	83.18	33.2	11.88	31.05	100	189	A	H
		5851.2	62.3	-57.16	119.46	47.95	33.38	12.03	31.06	100	189	P	H
		5870.2	61.15	-45.39	106.54	46.61	33.44	12.17	31.07	100	189	P	H
		5889.4	61.24	-33.27	94.51	46.66	33.49	12.17	31.08	100	189	P	H
		5941	61.52	-6.68	68.2	46.53	33.63	12.45	31.09	100	189	P	H
													H
													H
		5644.4	60.52	-7.68	68.2	46.93	32.8	11.79	31	324	105	P	V
		5694.2	60.07	-40.85	100.92	46.32	32.94	11.82	31.01	324	105	P	V
		5705.2	60.06	-46.6	106.66	46.27	32.97	11.84	31.02	324	105	P	V
		5722.2	59.94	-55.88	115.82	46.1	33.02	11.84	31.02	324	105	P	V
	*	5785	101.17	-	-	87.14	33.2	11.88	31.05	324	105	P	V
	*	5785	92.25	-	-	78.22	33.2	11.88	31.05	324	105	A	V
		5850.6	60.85	-59.98	120.83	46.5	33.38	12.03	31.06	324	105	P	V
		5855.2	60.74	-50	110.74	46.38	33.39	12.03	31.06	324	105	P	V
		5923.8	60.62	-8.46	69.08	45.81	33.59	12.31	31.09	324	105	P	V
		5950	60.67	-7.53	68.2	45.65	33.66	12.45	31.09	324	105	P	V
													V
													V

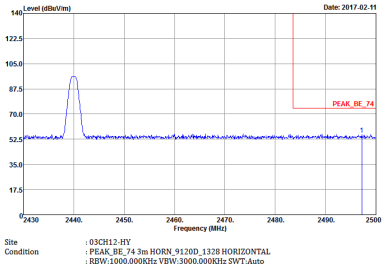
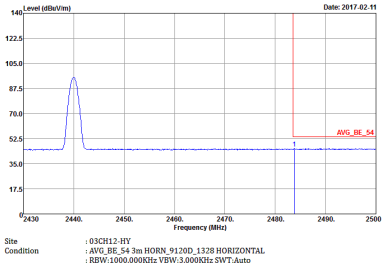
WIFI 802.11a (Harmonic @ 3m)

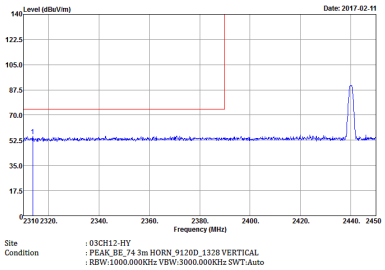
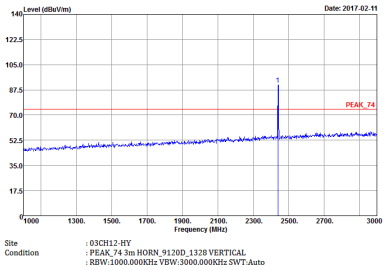
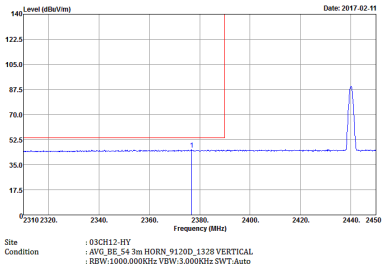
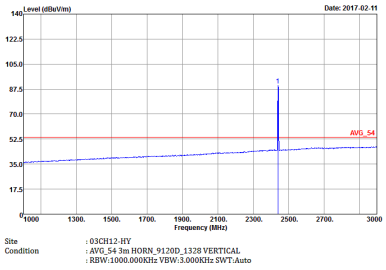
WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 157 5785MHz		11570	46.06	-27.94	74	45.31	40.06	18.49	57.8	100	0	P	H
		17355	55.56	-12.64	68.2	47.69	42.18	23.25	57.56	100	0	P	H
													H
													H
		11570	46.42	-27.58	74	45.67	40.06	18.49	57.8	100	0	P	V
		17355	55.83	-12.37	68.2	47.96	42.18	23.25	57.56	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

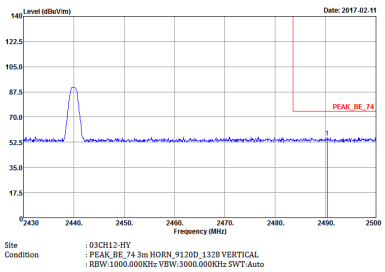
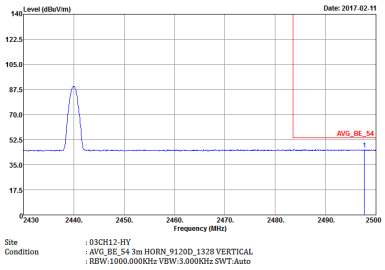
2.4GHz 2400~2483.5MHz

BLE (Band Edge @ 3m)

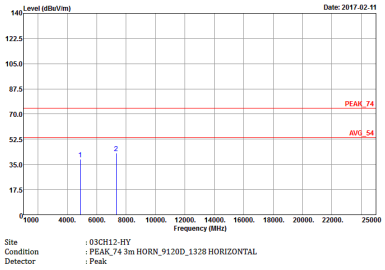
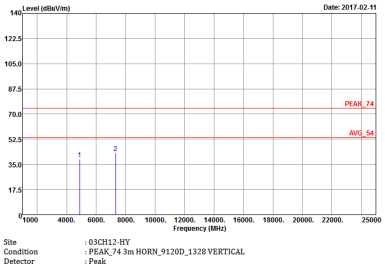
BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH19 2440MHz - L	
1	Horizontal	Fundamental
Peak		
Avg.		

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

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

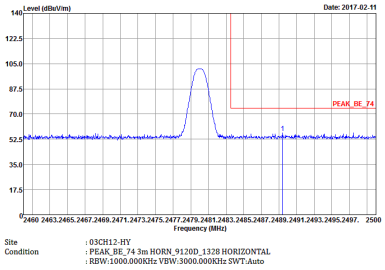
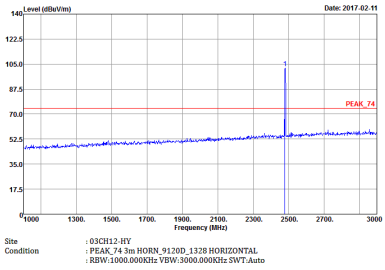
BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH19 2440MHz - R	
1	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

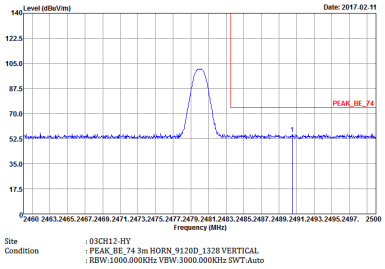
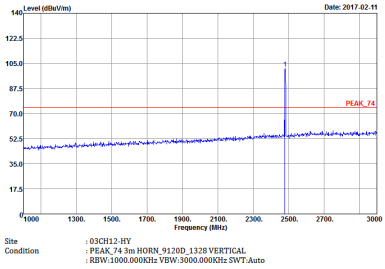
BLE (Harmonic @ 3m)

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

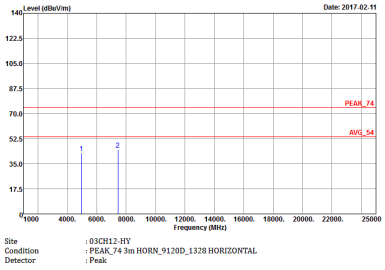
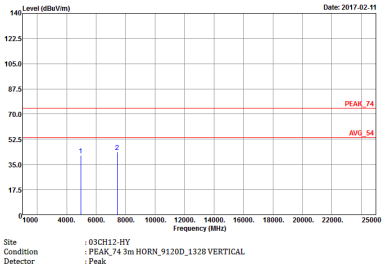
2.4GHz 2400~2483.5MHz

BT (Band Edge @ 3m)

BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BT CH78 2480MHz	
1	Horizontal	Fundamental
Peak		

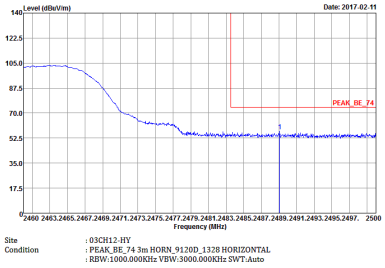
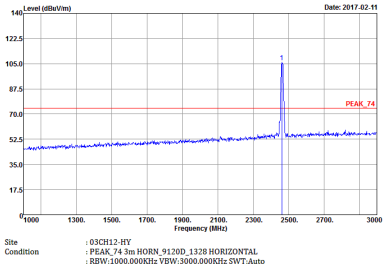
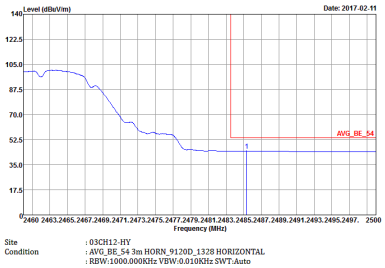
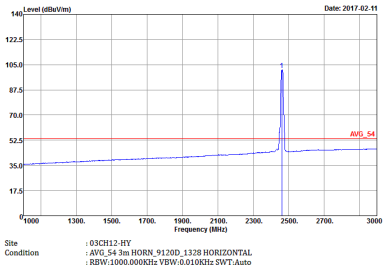
BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BT CH78 2480MHz	
1	Vertical	Fundamental
Peak		

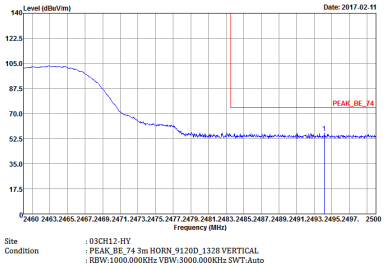
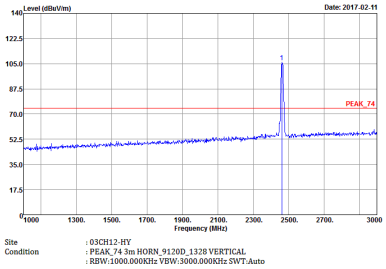
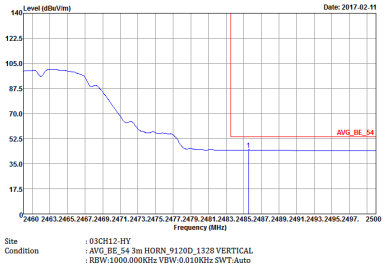
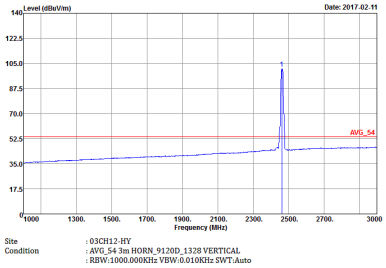
BT (Harmonic @ 3m)

BT	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	BT CH78 2480MHz	
1	Horizontal	Vertical
Peak Avg.		

2.4GHz 2400~2483.5MHz

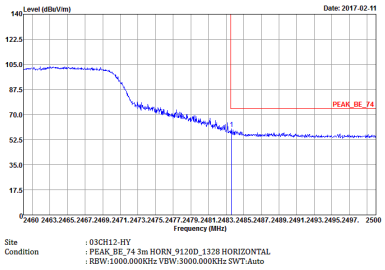
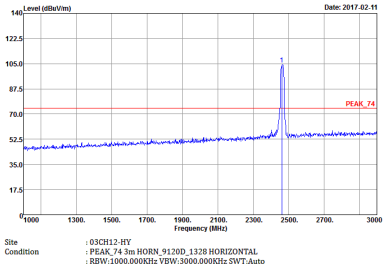
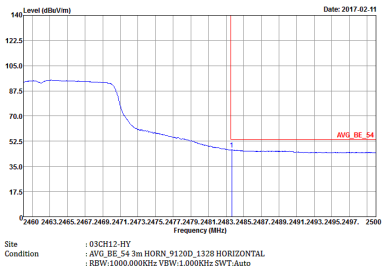
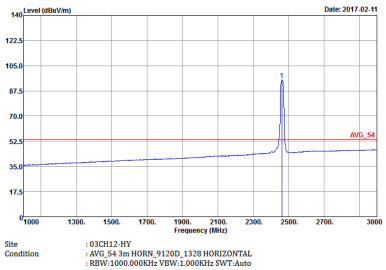
WIFI 802.11b (Band Edge @ 3m)

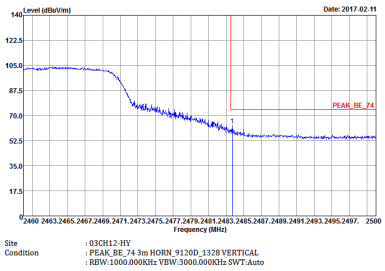
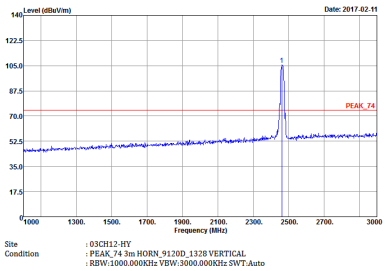
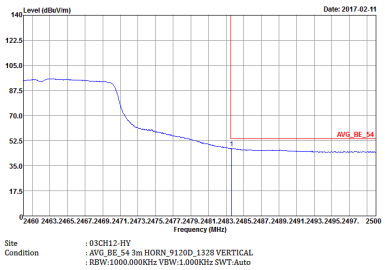
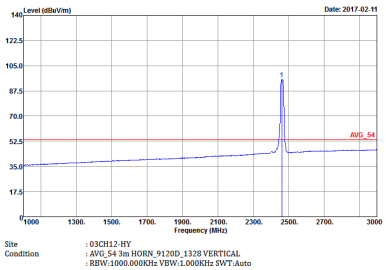
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH11 2462MHz	
1	Horizontal	Fundamental
Peak		
Avg.		

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH11 2462MHz	
1	Vertical	Fundamental
Peak		
Avg.		

2.4GHz 2400~2483.5MHz

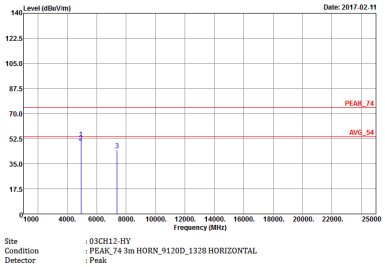
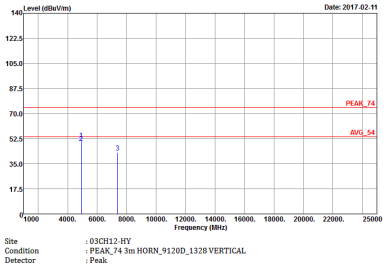
WIFI 802.11g (Band Edge @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH11 2462MHz	
1	Horizontal	Fundamental
Peak		
Avg.		

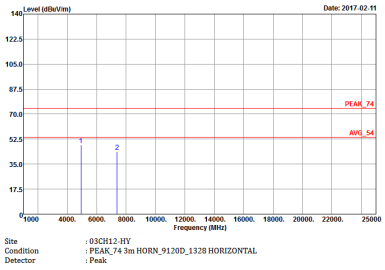
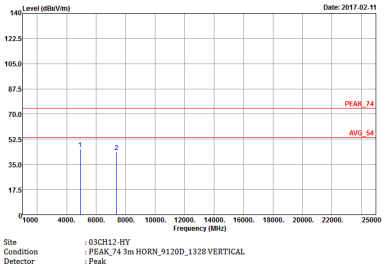
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH11 2462MHz	
1	Vertical	Fundamental
Peak		
Avg.		

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Harmonic @ 3m)

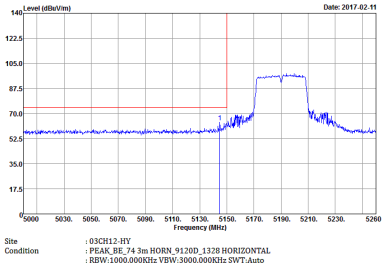
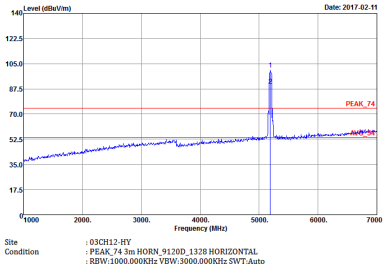
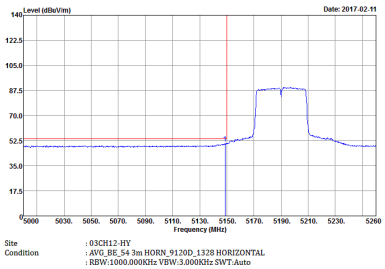
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH11 2462MHz	
1	Horizontal	Vertical
Peak Avg.		

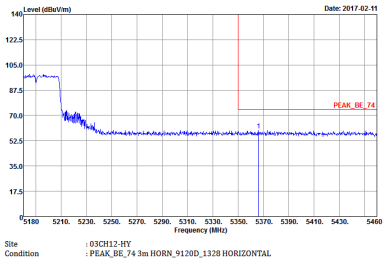
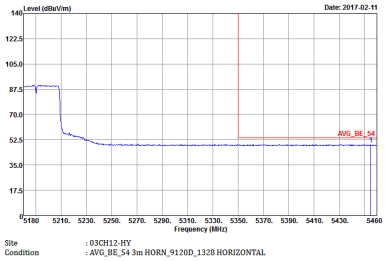
WIFI 802.11g (Harmonic @ 3m)

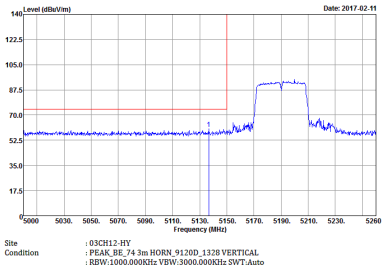
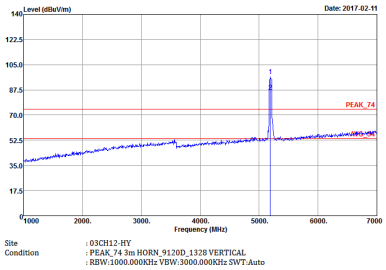
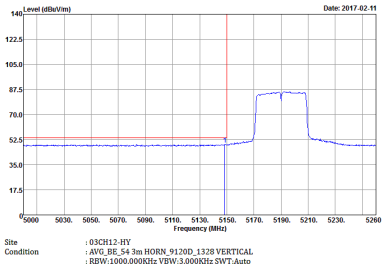
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH11 2462MHz	
1	Horizontal	Vertical
Peak Avg.		

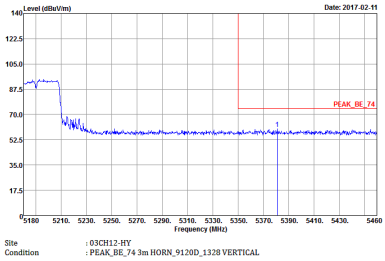
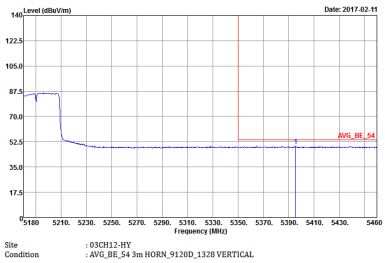
Band 1 - 5150~5250MHz

WIFI 802.11n HT40 (Band Edge @ 3m)

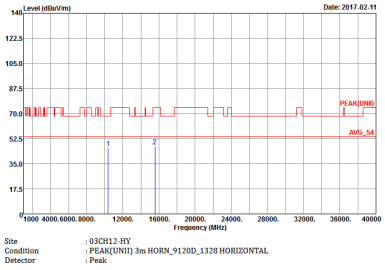
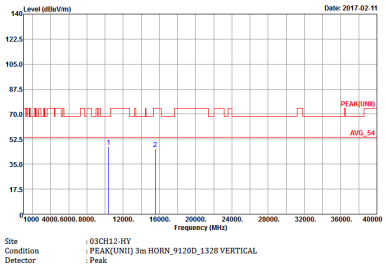
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT40 CH38 5190MHz - L	
1	Horizontal	Fundamental
Peak		
Avg.		Left blank

WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT40 CH38 5190MHz - R	
1	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT40 CH38 5190MHz - L	
1	Vertical	Fundamental
Peak		
Avg.		Left blank

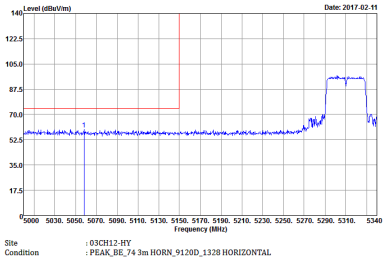
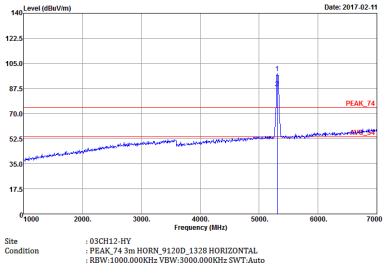
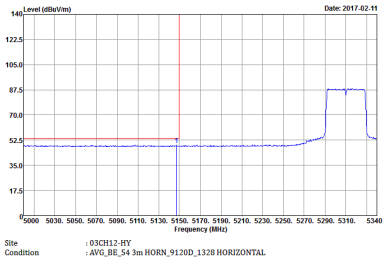
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT40 CH38 5190MHz - R	
1	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

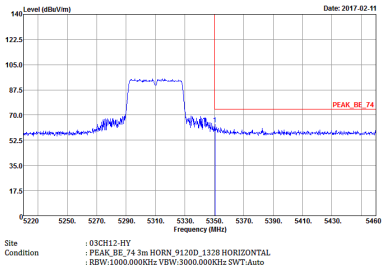
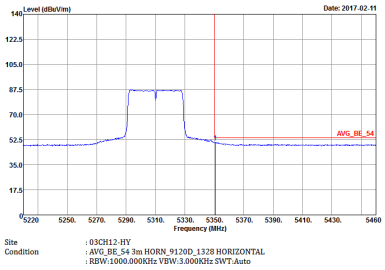
WIFI 802.11n HT40 (Harmonic @ 3m)

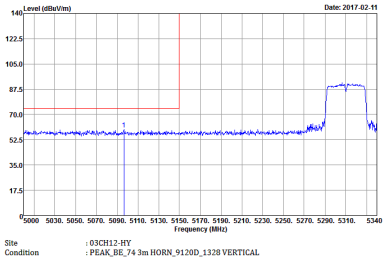
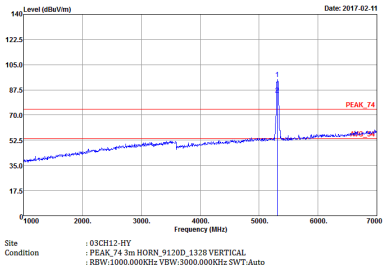
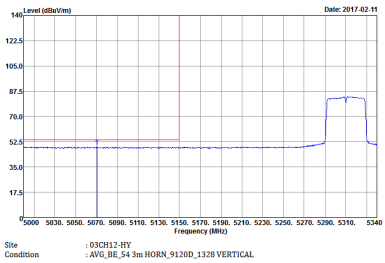
WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11n HT40 CH38 5190MHz	
1	Horizontal	Vertical
Peak Avg.		

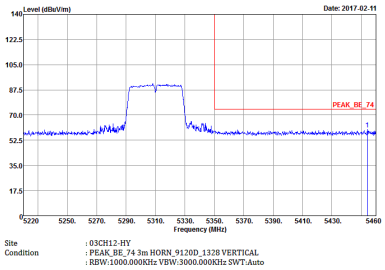
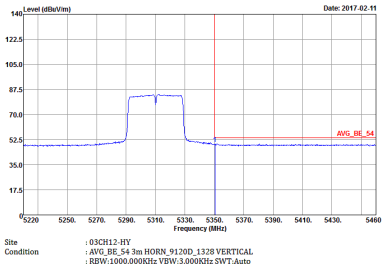
Band 2 - 5250~5350MHz

WIFI 802.11n HT40 (Band Edge @ 3m)

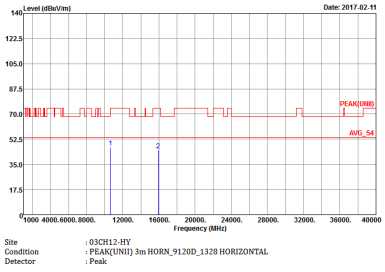
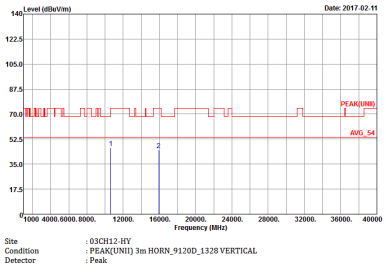
WIFI	Band 2 5250~5350MHz Band Edge @ 3m	
ANT	802.11n HT40 CH62 5310 MHz - L	
1	Horizontal	Fundamental
Peak		
Avg.		Left blank

WIFI	Band 2 5250~5350MHz Band Edge @ 3m	
ANT	802.11n HT40 CH62 5310 MHz - R	
1	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

WIFI	Band 2 5250~5350MHz Band Edge @ 3m	
ANT	802.11n HT40 CH62 5310 MHz - L	
1	Vertical	Fundamental
Peak		
Avg.		Left blank

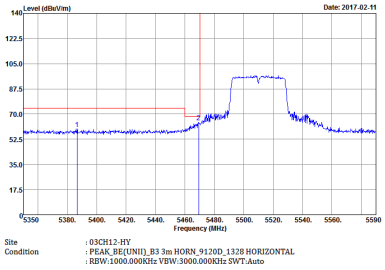
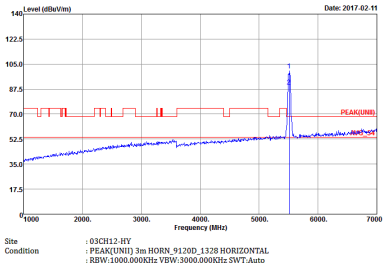
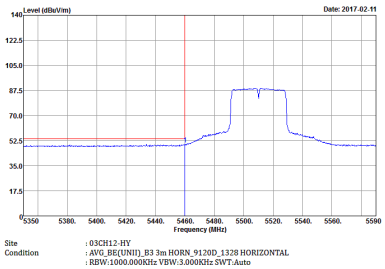
WIFI	Band 2 5250~5350MHz Band Edge @ 3m	
ANT	802.11n HT40 CH62 5310 MHz - R	
1	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

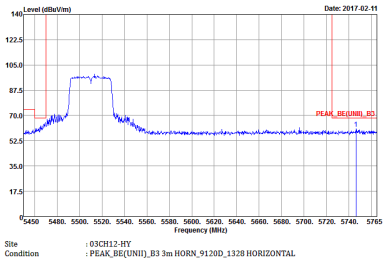
WIFI 802.11n HT40 (Harmonic @ 3m)

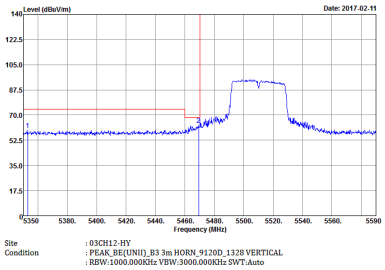
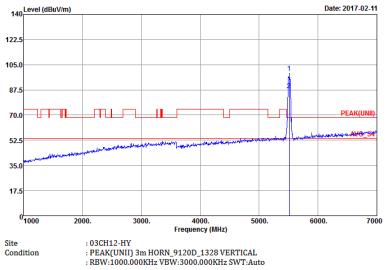
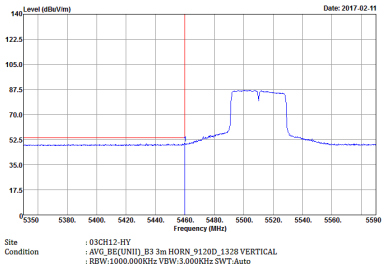
WIFI	Band 2 5250~5350MHz Harmonic @ 3m	
ANT	802.11n HT40 CH62 5310 MHz	
1	Horizontal	Vertical
Peak Avg.		

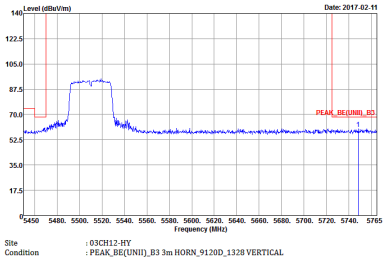
Band 3 - 5470~5725MHz

WIFI 802.11n HT40 (Band Edge @ 3m)

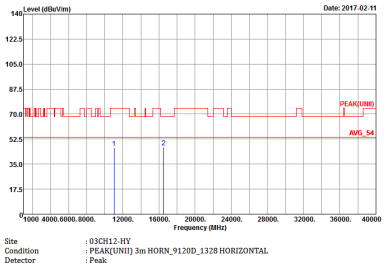
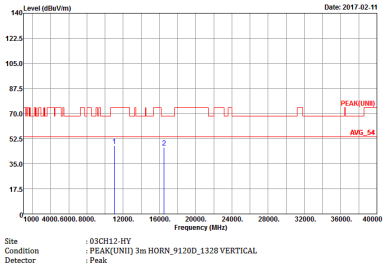
WIFI	Band 3 5470~5725MHz Band Edge @ 3m	
ANT	802.11n HT40 CH102 5510MHz - L	
1	Horizontal	Fundamental
Peak		
Avg.		Left blank

WIFI	Band 3 5470~5725MHz Band Edge @ 3m	
ANT	802.11n HT40 CH102 5510MHz - R	
1	Horizontal	Fundamental
Peak		Left blank

WIFI	Band 3 5470~5725MHz Band Edge @ 3m	
ANT	802.11n HT40 CH102 5510MHz - L	
1	Vertical	Fundamental
Peak		
Avg.		Left blank

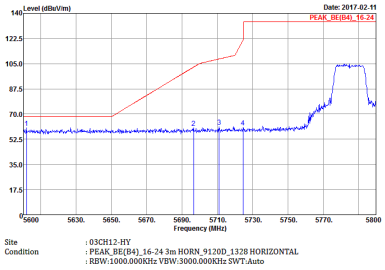
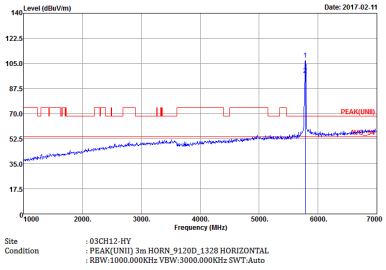
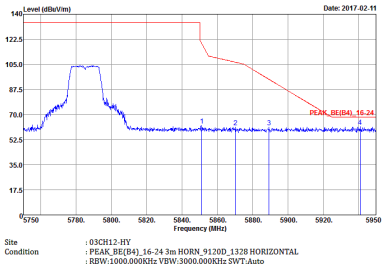
WIFI	Band 3 5470~5725MHz Band Edge @ 3m	
ANT	802.11n HT40 CH102 5510MHz - R	
1	Vertical	Fundamental
Peak		Left blank

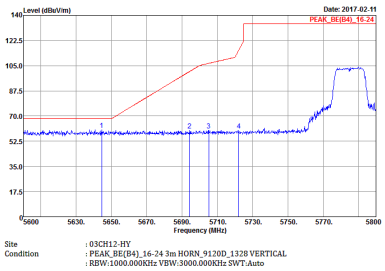
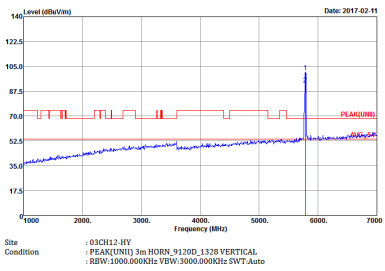
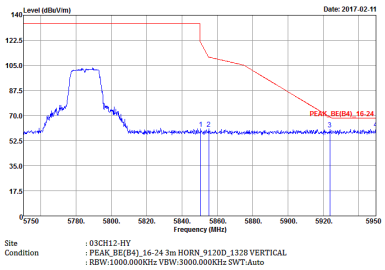
WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI	Band 3 5470~5725MHz Harmonic @ 3m	
ANT	802.11n HT40 CH102 5510MHz	
1	Horizontal	Vertical
Peak Avg.		

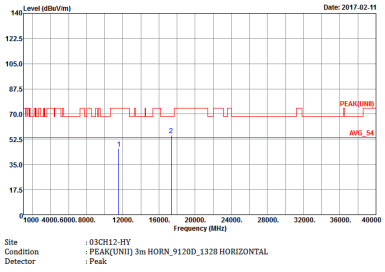
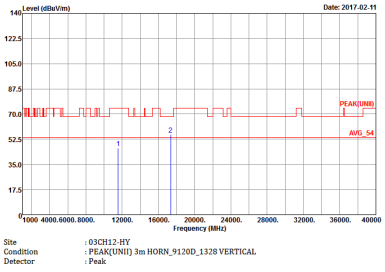
Band 4 - 5725~5850MHz

WIFI 802.11a (Band Edge @ 3m)

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz	
1	Horizontal	Fundamental
Peak		
Peak		Left blank

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz	
1	Vertical	Fundamental
Peak		
Peak		Left blank

WIFI 802.11a (Harmonic @ 3m)

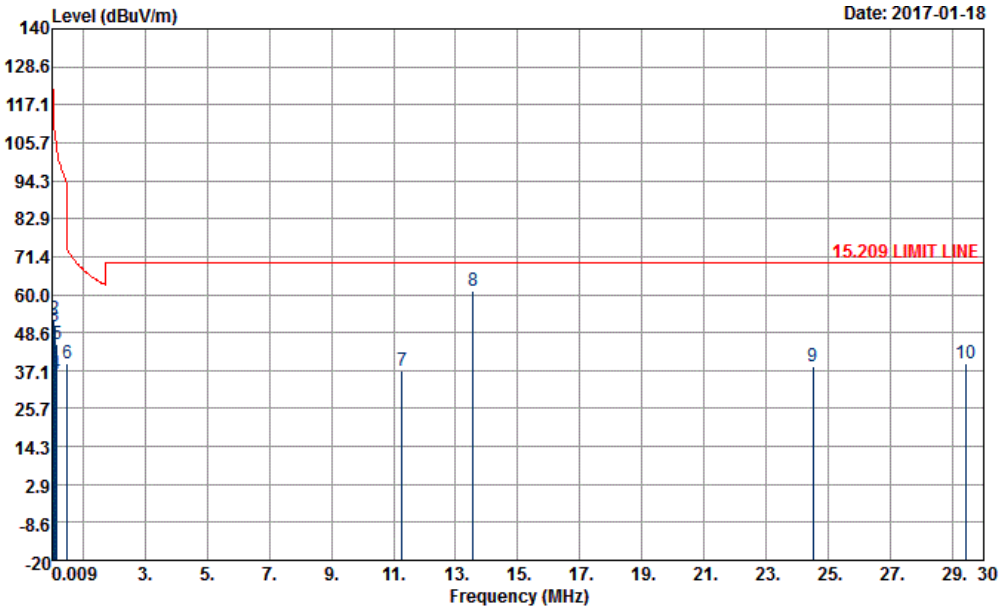
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH157 5785MHz	
1	Horizontal	Vertical
Peak Avg.		

Note symbol

*	**Fundamental Frequency** which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.
!	Test result is **over limit** line.
P/A	**P**eak or **A**verage
H/V	**H**orizontal or **V**ertical

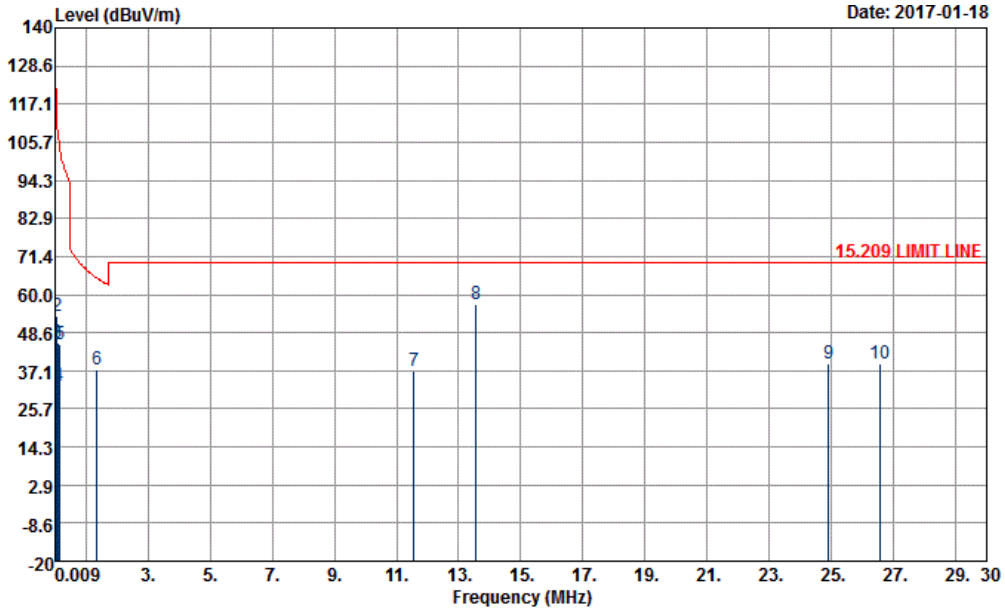
Results of Radiated Emissions (9 kHz~30MHz)

Test Mode :	NFC Tx	Polarization :	Horizontal



Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
0.01313	44.55	-80.69	125.24	20.97	22.9	0.68			Average
0.07179	52.55	-57.93	110.48	32.87	19	0.68			Average
0.09256	50.36	-57.92	108.28	30.88	18.8	0.68			QP
0.13892	36.06	-68.69	104.75	16.59	18.79	0.68			Average
0.16904	45.21	-57.83	103.04	25.76	18.77	0.68			Average
0.49	39.33	-34.47	73.8	20.05	18.6	0.68			QP
11.28	37.15	-32.35	69.5	16.41	20.06	0.68			QP
13.56	61.1	-8.4	69.5	39.91	20.51	0.68			QP
24.514	38.41	-31.09	69.5	15.27	22.07	1.07			QP
29.43	39.23	-30.27	69.5	15.79	22.37	1.07	100	179	QP

Test Mode :	NFC Tx	Polarization :	Vertical



Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
0.01344	45.72	-79.32	125.04	22.14	22.9	0.68			Average
0.07146	53.55	-56.97	110.52	33.87	19	0.68			Average
0.09194	45.38	-62.95	108.33	25.9	18.8	0.68			QP
0.11084	32.47	-74.24	106.71	12.99	18.8	0.68			Average
0.1534	45.14	-58.75	103.89	25.69	18.77	0.68			Average
1.346	37.52	-27.5	65.02	17.94	18.9	0.68	100	78	QP
11.552	37.04	-32.46	69.5	16.25	20.11	0.68			QP
13.56	57.3	-12.2	69.5	36.11	20.51	0.68			QP
24.901	39.3	-30.2	69.5	16.14	22.09	1.07			QP
26.555	39.38	-30.12	69.5	16.12	22.19	1.07			QP

End of this report