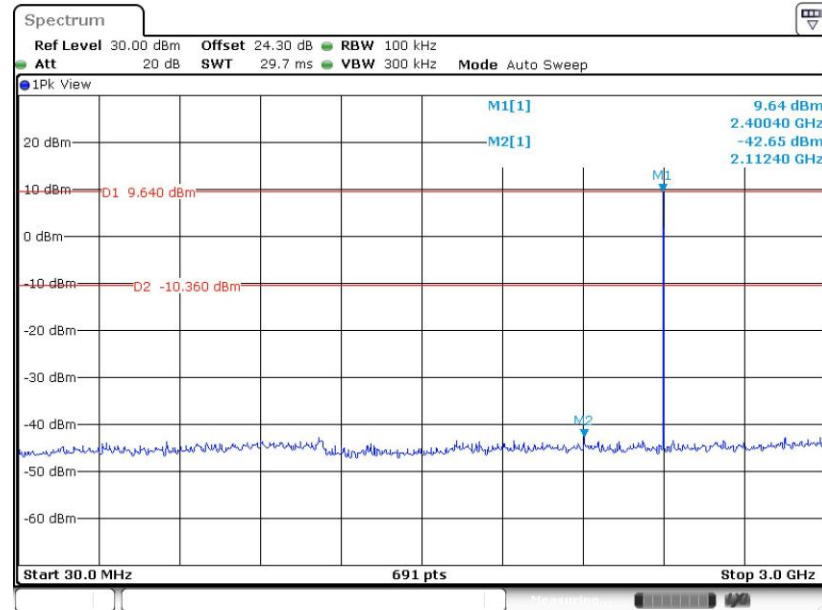


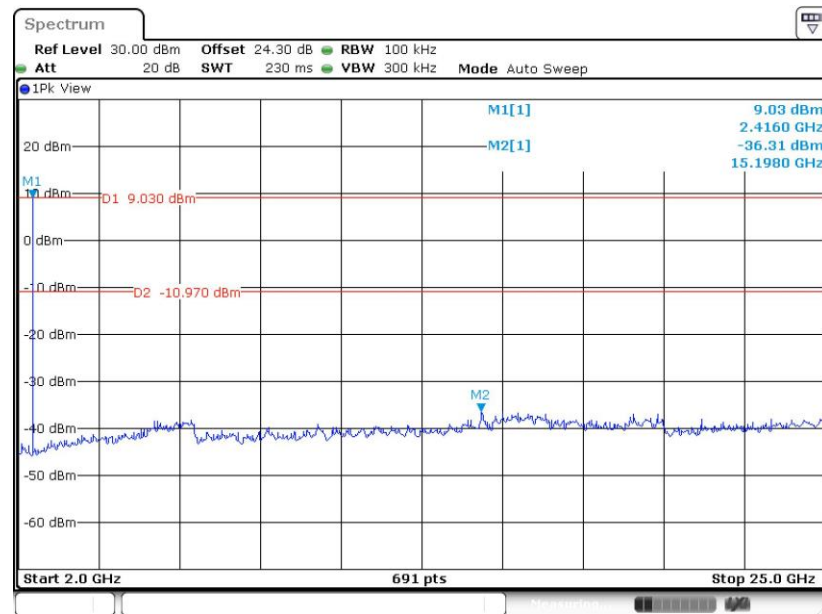
<3Mbps>

CSE Plot on Ch 00 between 30MHz ~ 3 GHz

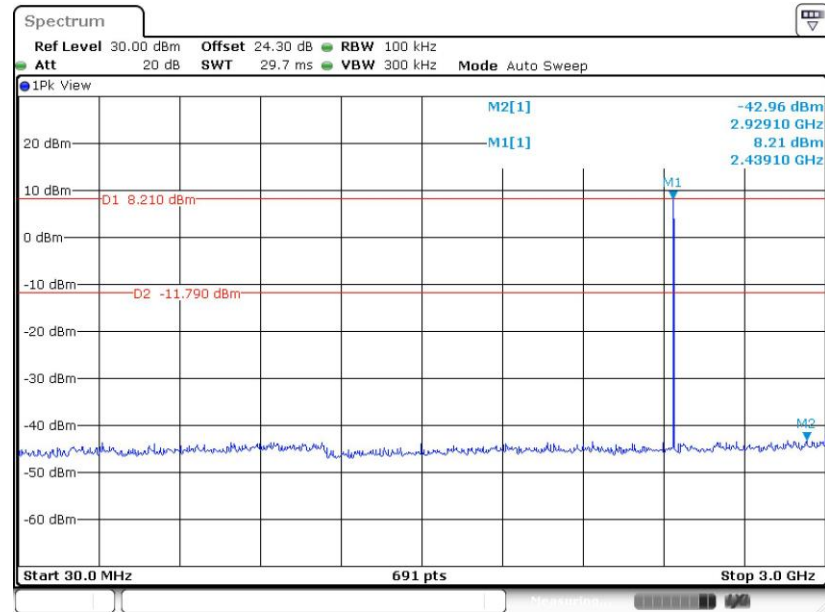


Date: 15.SEP.2018 11:15:15

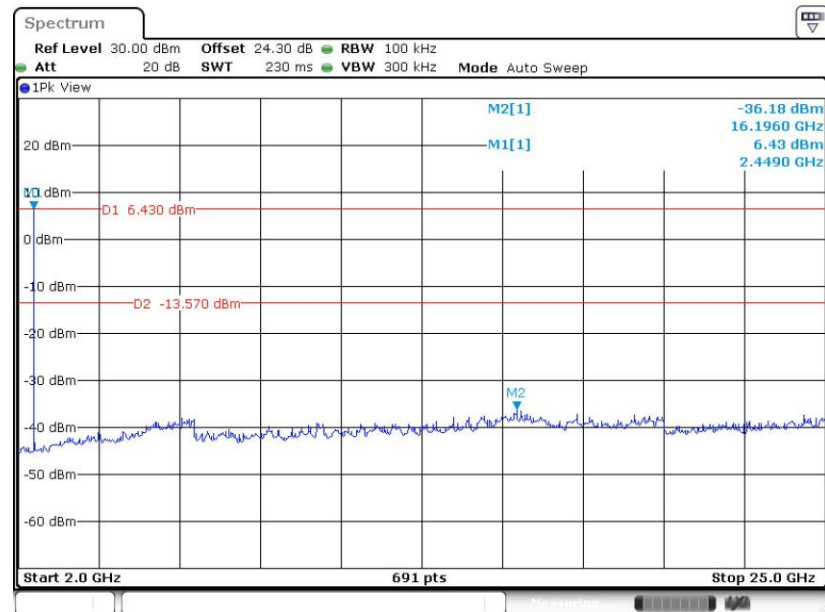
CSE Plot on Ch 00 between 2 GHz ~ 25 GHz



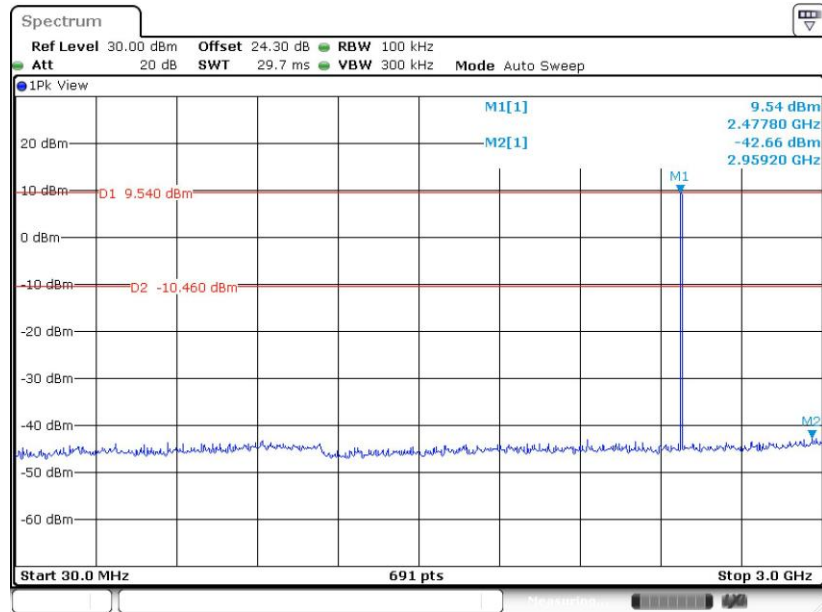
Date: 15.SEP.2018 11:15:56

**CSE Plot on Ch 39 between 30MHz ~ 3 GHz**

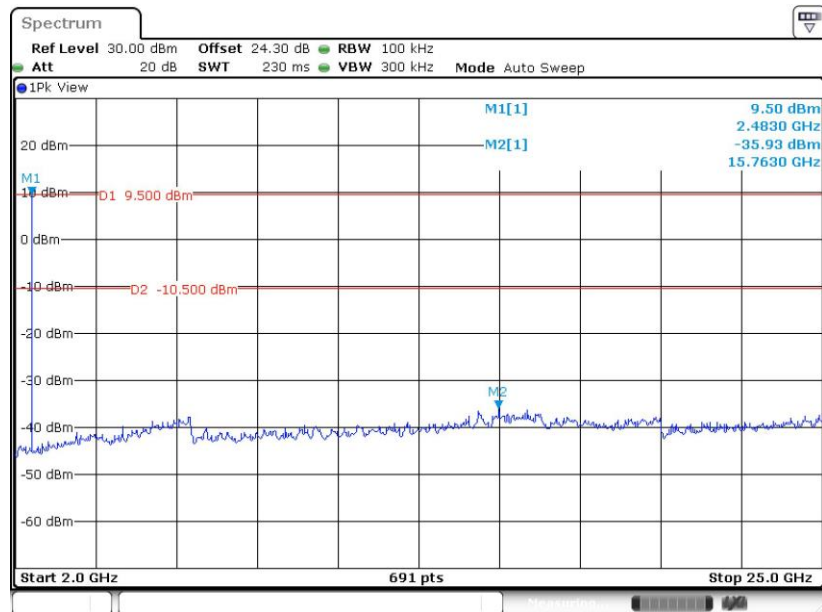
Date: 15.SEP.2018 11:13:09

CSE Plot on Ch 39 between 2 GHz ~ 25 GHz

Date: 15.SEP.2018 11:13:40

**CSE Plot on Ch 78 between 30MHz ~ 3 GHz**

Date: 15.SEP.2018 11:21:33

CSE Plot on Ch 78 between 2 GHz ~ 25 GHz

Date: 15.SEP.2018 11:21:59

3.8 Radiated Band Edges and Spurious Emission Measurement

3.8.1 Limit of Radiated Band Edges and Spurious Emission

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. In addition, radiated emissions which fall in the restricted bands must also comply with the limits as below.

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

3.8.2 Measuring Instruments

See list of measuring equipment of this test report.

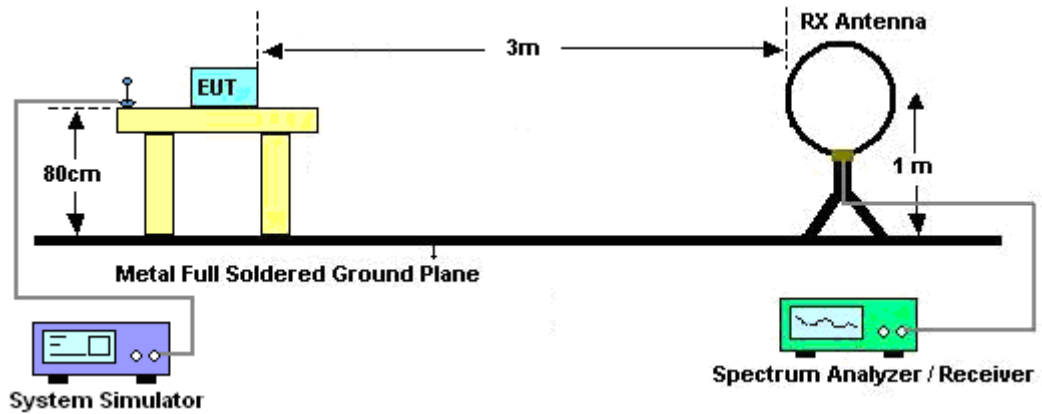
3.8.3 Test Procedures

1. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
4. Set to the maximum power setting and enable the EUT transmit continuously.
5. Use the following spectrum analyzer settings:
 - (1) Span shall wide enough to fully capture the emission being measured;
 - (2) Set RBW=100 kHz for $f < 1$ GHz, RBW=1MHz for $f > 1$ GHz ; VBW $\geq$ RBW; Sweep = auto; Detector function = peak; Trace = max hold for peak
 - (3) For average measurement: use duty cycle correction factor method per 15.35(c).
Duty cycle = On time/100 milliseconds
On time = $N_1 * L_1 + N_2 * L_2 + \dots + N_{n-1} * L_{n-1} + N_n * L_n$
Where N_1 is number of type 1 pulses, L_1 is length of type 1 pulses, etc.
Average Emission Level = Peak Emission Level + $20 * \log(\text{Duty cycle})$
6. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
7. For testing below 1GHz, if the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the CISPR quasi-peak method and reported.
8. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in average mode also complies with the limit in average mode), then peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

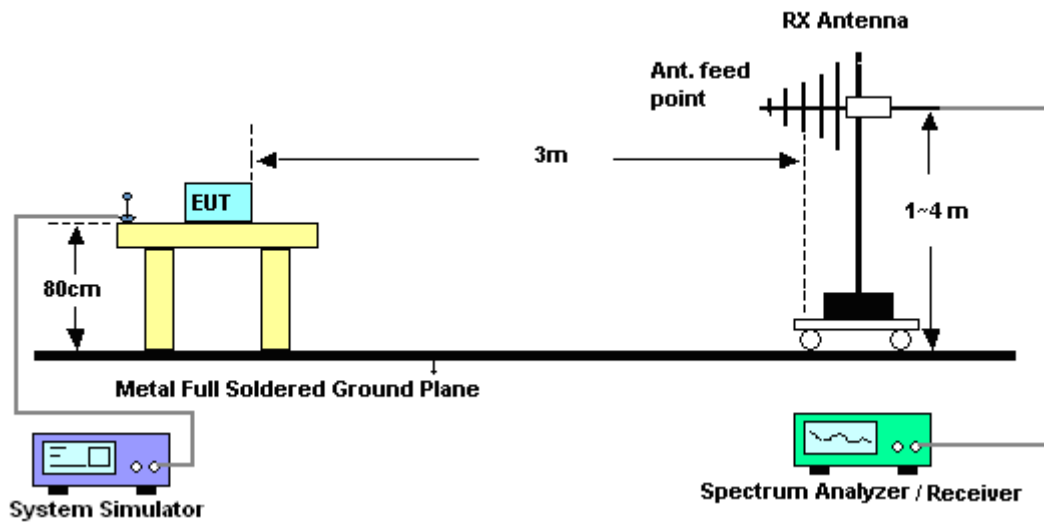
Note: The average levels were calculated from the peak level corrected with duty cycle correction factor (-24.79dB) derived from $20 \log(\text{dwell time}/100\text{ms})$. This correction is only for signals that hop with the fundamental signal, such as band-edge and harmonic. Other spurious signals that are independent of the hopping signal would not use this correction.

3.8.4 Test Setup

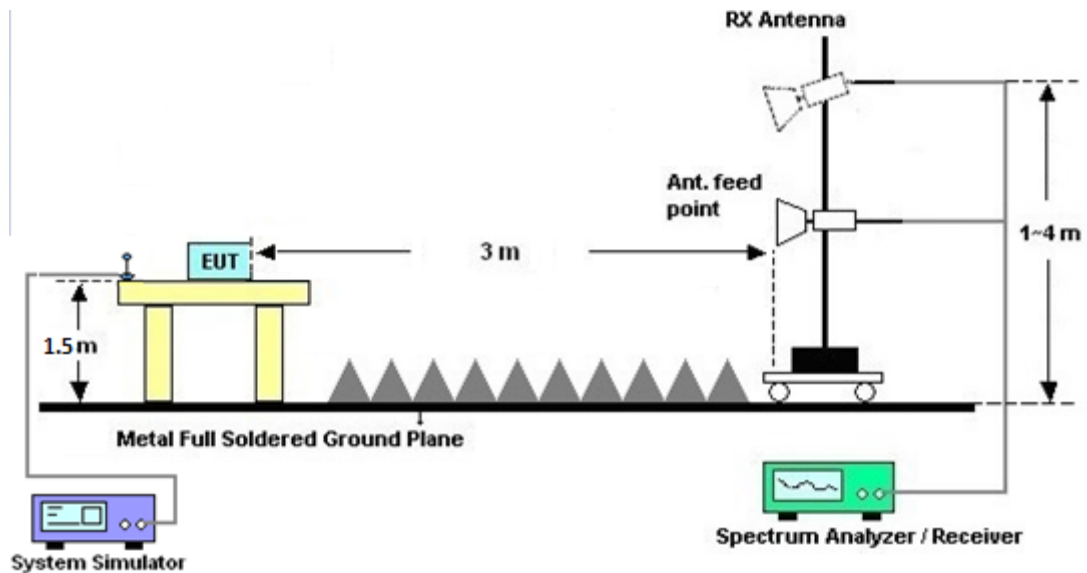
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.8.5 Test Results of Radiated Spurious Emissions (9 kHz ~ 30 MHz)

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

There is a comparison data of both open-field test site and alternative test site - semi-Anechoic chamber according to 414788 D01 Radiated Test Site v01r01, and the result came out very similar.

3.8.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix C and D.

3.8.7 Duty Cycle

Please refer to Appendix E.

3.8.8 Test Result of Radiated Spurious Emission (30MHz ~ 10th Harmonic)

Please refer to Appendix C and D.

3.9 AC Conducted Emission Measurement

3.9.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

Frequency of emission (MHz)	Conducted limit (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

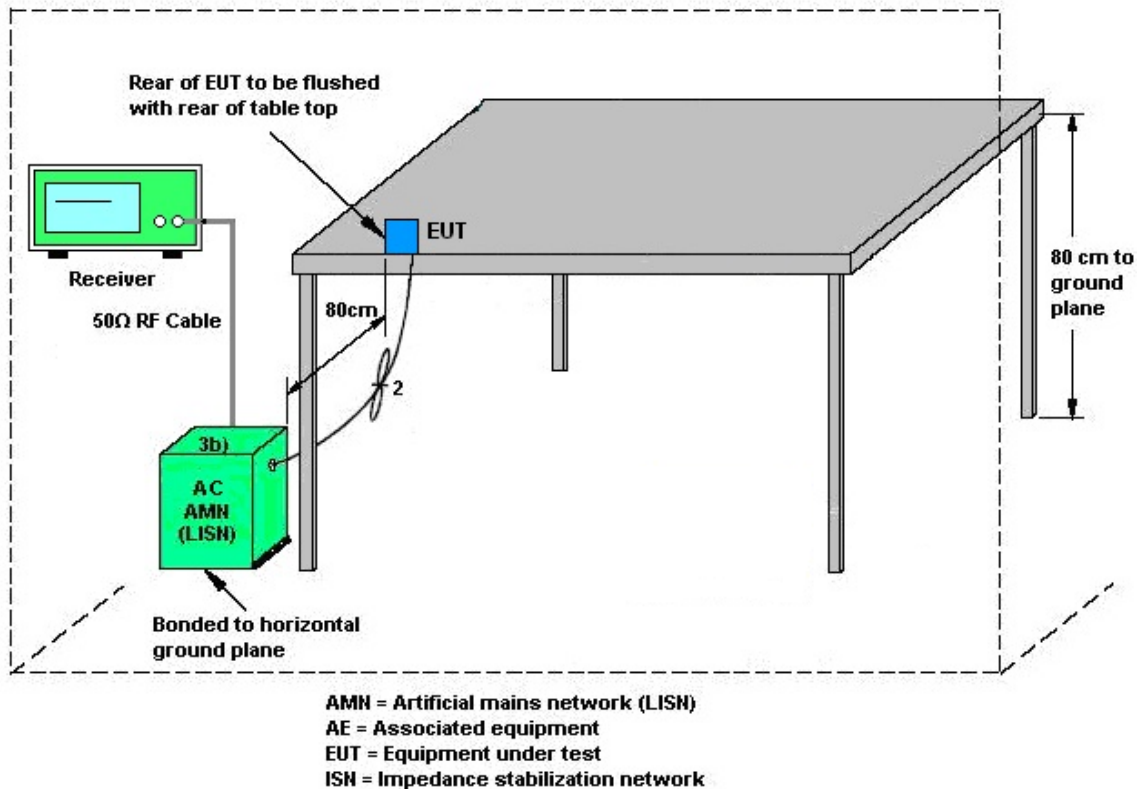
3.9.2 Measuring Instruments

See list of measuring equipment of this test report.

3.9.3 Test Procedures

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF Bandwidth = 9kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.

3.9.4 Test Setup



3.9.5 Test Result of AC Conducted Emission

Please refer to Appendix B.



3.10 Antenna Requirements

3.10.1 Standard Applicable

If directional gain of transmitting antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the rule.

3.10.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.10.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.



4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Hygrometer	Testo	DTM-303A	TP157075	N/A	Mar. 06, 2018	Sep. 14, 2018~ Sep. 16, 2018	Mar. 05, 2019	Conducted (TH05-HY)
Power Meter	Agilent	E4416A	GB412923 44	N/A	Dec. 20, 2017	Sep. 14, 2018~ Sep. 16, 2018	Dec. 19, 2018	Conducted (TH05-HY)
Power Sensor	Agilent	E9327A	US404415 48	50MHz~18GHz	Dec. 20, 2017	Sep. 14, 2018~ Sep. 16, 2018	Dec. 19, 2018	Conducted (TH05-HY)
Signal Analyzer	Rohde & Schwarz	FSV40	101397	10Hz~40GHz	Nov. 07, 2017	Sep. 14, 2018~ Sep. 16, 2018	Nov. 06, 2018	Conducted (TH05-HY)
Switch Box & RF Cable	Burgeon	ETF-058	EC130048 4	N/A	Mar. 01, 2018	Sep. 14, 2018~ Sep. 16, 2018	Feb. 28, 2019	Conducted (TH05-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Sep. 13, 2018	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102388	9KHz~3.6GHz	Dec. 08, 2017	Sep. 13, 2018	Dec. 07, 2018	Conduction (CO05-HY)
Hygrometer	Testo	608-H1	34913912	N/A	Mar. 06, 2018	Sep. 13, 2018	Mar. 05, 2019	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Nov. 30, 2017	Sep. 13, 2018	Nov. 29, 2018	Conduction (CO05-HY)
Software	Rohde & Schwarz	EMC32 V10.30	N/A	N/A	N/A	Sep. 13, 2018	N/A	Conduction (CO05-HY)
LF Cable	HUBER + SUHNER	RG-214/U	LF01	N/A	Jan. 03, 2018	Sep. 13, 2018	Jan. 02, 2019	Conduction (CO05-HY)
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100851	N/A	Jan. 03, 2018	Sep. 13, 2018	Jan. 02, 2019	Conduction (CO05-HY)
Amplifier	MITEQ	TTA1840-35- HG	1871923	18GHz~40GHz, VSWR : 2.5:1 max	Jul. 16, 2018	Sep. 23, 2018~ Sep. 24, 2018	Jul. 15, 2019	Radiation (03CH11-HY)
Amplifier	SONOMA	310N	187312	9kHz~1GHz	Jan. 16, 2018	Sep. 23, 2018~ Sep. 24, 2018	Jan. 15, 2019	Radiation (03CH11-HY)
Bilog Antenna	TESEQ	CBL 6111D&N-6- 06	35414&AT- N0602	30MHz~1GHz	Oct. 14, 2017	Sep. 23, 2018~ Sep. 24, 2018	Oct. 13, 2018	Radiation (03CH11-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120 D	9120D-132 6	1GHz ~ 18GHz	Oct. 16, 2017	Sep. 23, 2018~ Sep. 24, 2018	Oct. 15, 2018	Radiation (03CH11-HY)
Hygrometer	TECPEL	DTN-303B	TP140325	N/A	Oct. 12, 2017	Sep. 23, 2018~ Sep. 24, 2018	Oct. 11, 2018	Radiation (03CH11-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Nov. 23, 2017	Sep. 23, 2018~ Sep. 24, 2018	Nov. 22, 2018	Radiation (03CH11-HY)
Preamplifier	Keysight	83017A	MY532700 80	1GHz~26.5GHz	Jan. 16, 2018	Sep. 23, 2018~ Sep. 24, 2018	Jan. 15, 2020	Radiation (03CH11-HY)
Spectrum Analyzer	Keysight	N9010A	MY542004 86	10Hz ~ 44GHz	Oct. 19, 2017	Sep. 23, 2018~ Sep. 24, 2018	Oct. 18, 2018	Radiation (03CH11-HY)



Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Controller	EMEC	EM 1000	N/A	Control Turn table & Ant Mast	N/A	Sep. 23, 2018~ Sep. 24, 2018	N/A	Radiation (03CH11-HY)
Antenna Mast	EMEC	AM-BS-4500 -B	N/A	1~4m	N/A	Sep. 23, 2018~ Sep. 24, 2018	N/A	Radiation (03CH11-HY)
Turn Table	EMEC	TT 2000	N/A	0~360 Degree	N/A	Sep. 23, 2018~ Sep. 24, 2018	N/A	Radiation (03CH11-HY)
Preamplifier	Jet-Power	JPA0118-55- 303K	17100018 00054001	1GHz~18GHz	Apr. 16, 2018	Sep. 23, 2018~ Sep. 24, 2018	Apr. 15, 2019	Radiation (03CH11-HY)
SHF-EHF Horn Antenna	SCHWARZBE CK	BBHA 9170	BBHA9170 584	18GHz- 40GHz	Nov. 27, 2017	Sep. 23, 2018~ Sep. 24, 2018	Nov. 26, 2018	Radiation (03CH11-HY)
Software	Audix	E3 6.2009-8-24	RK-00104 2	N/A	N/A	Sep. 23, 2018~ Sep. 24, 2018	N/A	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY9837/4 PE	9kHz-30MHz	Mar. 14, 2018	Sep. 23, 2018~ Sep. 24, 2018	Mar. 13, 2019	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	MY2859/2	30MHz-40GHz	Mar. 14, 2018	Sep. 23, 2018~ Sep. 24, 2018	Mar. 13, 2019	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY9837/4 PE	30M-18G	Mar. 14, 2018	Sep. 23, 2018~ Sep. 24, 2018	Mar. 13, 2019	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	MY4274/2	30MHz-40GHz	Mar. 14, 2018	Sep. 23, 2018~ Sep. 24, 2018	Mar. 13, 2019	Radiation (03CH11-HY)
Filter	Wainwright	WLK4-1000- 1530-8000-4 0SS	SN11	1G Low Pass	Sep. 17, 2018	Sep. 23, 2018~ Sep. 24, 2018	Sep. 16, 2019	Radiation (03CH11-HY)
Filter	Wainwright	WHKX12-27 00-3000-180 00-60SS	SN3	2.7G High Pass	Sep. 17, 2018	Sep. 23, 2018~ Sep. 24, 2018	Sep. 16, 2019	Radiation (03CH11-HY)

5 Uncertainty of Evaluation

Uncertainty of Conducted Emission Measurement (150 kHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	2.20
--	------

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	5.20
--	------

Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	5.50
--	------

Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	5.20
--	------

Appendix A. Test Result of Conducted Test Items

Test Engineer:	Shiming Liu	Temperature:	21~25	°C
Test Date:	2018/9/14~2018/9/16	Relative Humidity:	51~54	%

TEST RESULTS DATA**20dB and 99% Occupied Bandwidth and Hopping Channel Separation**

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	20db BW (MHz)	99% Bandwidth (MHz)	Hopping Channel Separation Measurement (MHz)	Hopping Channel Separation Measurement Limit (MHz)	Pass/Fail
DH	1Mbps	1	0	2402	0.920	0.848	0.999	0.6136	Pass
DH	1Mbps	1	39	2441	0.918	0.845	1.003	0.6117	Pass
DH	1Mbps	1	78	2480	0.918	0.848	1.003	0.6117	Pass
2DH	2Mbps	1	0	2402	1.259	1.164	1.072	0.8393	Pass
2DH	2Mbps	1	39	2441	1.259	1.164	1.164	0.8393	Pass
2DH	2Mbps	1	78	2480	1.259	1.166	1.146	0.8393	Pass
3DH	3Mbps	1	0	2402	1.233	1.152	0.847	0.8220	Pass
3DH	3Mbps	1	39	2441	1.216	1.149	0.973	0.8104	Pass
3DH	3Mbps	1	78	2480	1.233	1.149	1.155	0.8220	Pass

TEST RESULTS DATA**Dwell Time**

Mod.	Hopping Channel Number Rate	Hops Over Occupancy Time(hops)	Package Transfer Time (msec)	Dwell Time (sec)	Limits (sec)	Pass/Fail
Nomal	79	106.67	2.90	0.31	0.4	Pass
AFH	20	53.33	2.90	0.15	0.4	Pass

TEST RESULTS DATA**Peak Power Table**

DH	CH.	NTX	Peak Power (dBm)	Power Limit (dBm)	Test Result
DH1	0	1	11.23	20.97	Pass
	39	1	10.52	20.97	Pass
	78	1	11.36	20.97	Pass
2DH1	0	1	10.64	20.97	Pass
	39	1	9.64	20.97	Pass
	78	1	10.74	20.97	Pass
3DH1	0	1	11.01	20.97	Pass
	39	1	10.18	20.97	Pass
	78	1	11.13	20.97	Pass

TEST RESULTS DATA**Average Power Table****(Reporting Only)**

DH	CH.	NTX	Average Power (dBm)	Duty Factor (dB)
DH1	0	1	11.11	5.16
	39	1	10.37	5.16
	78	1	11.17	5.16
2DH1	0	1	8.62	5.12
	39	1	7.44	5.12
	78	1	8.70	5.12
3DH1	0	1	8.64	5.12
	39	1	7.46	5.12
	78	1	8.74	5.12

TEST RESULTS DATA**Number of Hopping Frequency**

Number of Hopping (Channel)	Adaptive Frequency Hopping (Channel)	Limits (Channel)	Pass/Fail
79	20	> 15	Pass



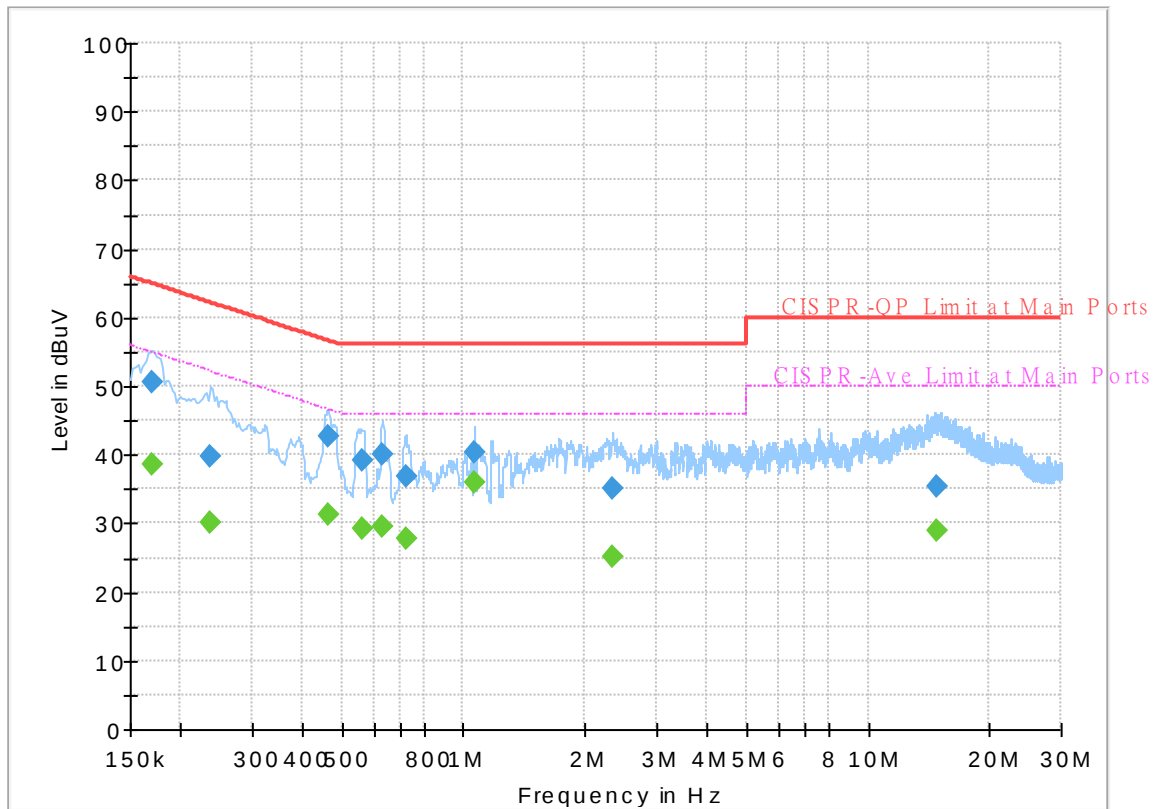
Appendix B. AC Conducted Emission Test Results

Test Engineer :	Rick Lin	Temperature :	24~25℃
		Relative Humidity :	61~62%

EUT Information

Report NO : 882920-01
Test Mode : Mode 1
Test Voltage : 120Vac/60Hz
Phase : Line

Full Spectrum



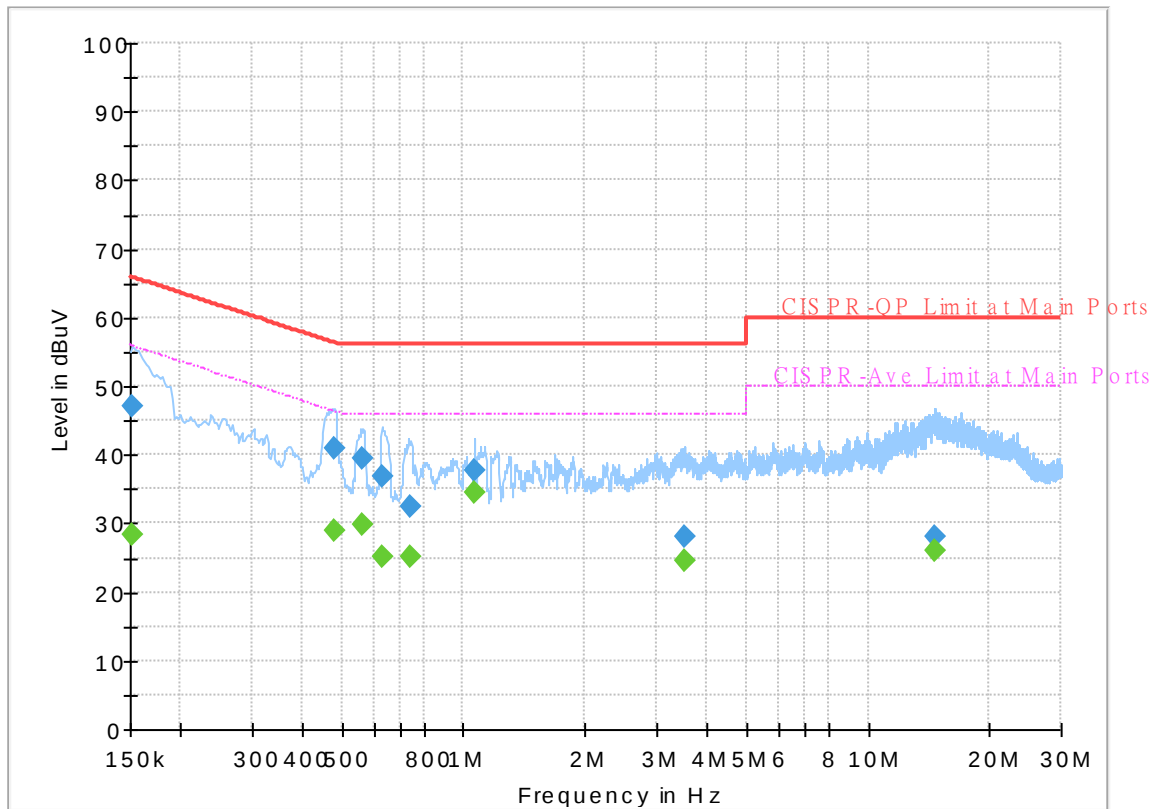
Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.170250	---	38.47	54.95	16.48	L1	OFF	19.5
0.170250	50.65	---	64.95	14.30	L1	OFF	19.5
0.237750	---	30.09	52.17	22.08	L1	OFF	19.5
0.237750	39.73	---	62.17	22.44	L1	OFF	19.5
0.462750	---	31.37	46.64	15.27	L1	OFF	19.5
0.462750	42.57	---	56.64	14.07	L1	OFF	19.5
0.564000	---	29.14	46.00	16.86	L1	OFF	19.5
0.564000	39.28	---	56.00	16.72	L1	OFF	19.5
0.633750	---	29.66	46.00	16.34	L1	OFF	19.6
0.633750	40.07	---	56.00	15.93	L1	OFF	19.6
0.719250	---	27.74	46.00	18.26	L1	OFF	19.6
0.719250	36.80	---	56.00	19.20	L1	OFF	19.6
1.068000	---	36.05	46.00	9.95	L1	OFF	19.6
1.068000	40.26	---	56.00	15.74	L1	OFF	19.6
2.332500	---	25.19	46.00	20.81	L1	OFF	19.5
2.332500	34.94	---	56.00	21.06	L1	OFF	19.5
14.752500	---	29.00	50.00	21.00	L1	OFF	20.1
14.752500	35.24	---	60.00	24.76	L1	OFF	20.1

EUT Information

Report NO : 882920-01
 Test Mode : Mode 1
 Test Voltage : 120Vac/60Hz
 Phase : Neutral

Full Spectrum



Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.152250	---	28.43	55.88	27.45	N	OFF	19.5
0.152250	47.13	---	65.88	18.75	N	OFF	19.5
0.480750	---	28.80	46.33	17.53	N	OFF	19.5
0.480750	40.83	---	56.33	15.50	N	OFF	19.5
0.564000	---	29.71	46.00	16.29	N	OFF	19.5
0.564000	39.40	---	56.00	16.60	N	OFF	19.5
0.627000	---	25.05	46.00	20.95	N	OFF	19.6
0.627000	36.82	---	56.00	19.18	N	OFF	19.6
0.741750	---	25.28	46.00	20.72	N	OFF	19.6
0.741750	32.39	---	56.00	23.61	N	OFF	19.6
1.065750	---	34.39	46.00	11.61	N	OFF	19.6
1.065750	37.62	---	56.00	18.38	N	OFF	19.6
3.507000	---	24.62	46.00	21.38	N	OFF	19.7
3.507000	28.10	---	56.00	27.90	N	OFF	19.7
14.570250	---	26.00	50.00	24.00	N	OFF	20.1
14.570250	28.08	---	60.00	31.92	N	OFF	20.1



Appendix C. Radiated Spurious Emission

Test Engineer :	HAO HSU and Chuan Zhu	Temperature :	21~26°C
		Relative Humidity :	52~57%

2.4GHz 2400~2483.5MHz

BT 1Mbps (Band Edge @ 3m)

BT	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BT CH00 2402MHz		2390	42.59	-31.41	74	42.47	27.13	6.58	33.59	178	145	P	H
		2390	17.8	-36.2	54	-	-	-	-	-	-	A	H
	*	2402	107.56	-	-	107.43	27.13	6.59	33.59	178	145	P	H
	*	2402	82.77	-	-	-	-	-	-	-	-	A	H
													H
													H
		2363.97	42.9	-31.1	74	42.92	27.04	6.54	33.6	359	360	P	V
		2363.97	18.11	-35.89	54	-	-	-	-	-	-	A	V
	*	2402	103.3	-	-	103.17	27.13	6.59	33.59	359	360	P	V
	*	2402	78.51	-	-	-	-	-	-	-	-	A	V
													V
													V
BT CH 39 2441MHz		2323.44	42.6	-31.4	74	42.78	26.95	6.48	33.61	172	143	P	H
		2323.44	17.81	-36.19	54	-	-	-	-	-	-	A	H
	*	2441	108.25	-	-	107.94	27.27	6.62	33.58	172	143	P	H
	*	2441	83.46	-	-	-	-	-	-	-	-	A	H
		2487.47	43.43	-30.57	74	42.99	27.36	6.66	33.58	172	143	P	H
		2487.47	18.64	-35.36	54	-	-	-	-	-	-	A	H
		2381.68	44.16	-29.84	74	44.11	27.09	6.56	33.6	393	360	P	V
		2381.68	19.37	-34.63	54	-	-	-	-	-	-	A	V
	*	2441	103.09	-	-	102.78	27.27	6.62	33.58	393	360	P	V
	*	2441	78.3	-	-	-	-	-	-	-	-	A	V
		2494.82	43.47	-30.53	74	42.97	27.4	6.67	33.57	393	360	P	V
		2494.82	18.68	-35.32	54	-	-	-	-	-	-	A	V



BT CH 78 2480MHz	*	2480	108.28	-	-	107.85	27.36	6.65	33.58	152	142	P	H
	*	2480	83.49	-	-	-	-	-	-	-	-	A	H
		2483.56	56.15	-17.85	74	55.71	27.36	6.66	33.58	152	142	P	H
		2483.56	31.36	-22.64	54	-	-	-	-	-	-	A	H
													H
													H
	*	2480	103.54	-	-	103.11	27.36	6.65	33.58	331	350	P	V
	*	2480	78.75	-	-	-	-	-	-	-	-	A	V
		2483.56	51.12	-22.88	74	50.68	27.36	6.66	33.58	331	350	P	V
		2483.56	26.33	-27.67	54	-	-	-	-	-	-	A	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
BT 1Mbps (Harmonic @ 3m)

BT	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
BT CH 00 2402MHz		4804	46.15	-27.85	74	63.41	31.26	10.06	58.58	100	0	P	H
		4804	21.36	-32.64	54	-	-	-	-	-	-	A	H
													H
													H
		4804	46.34	-27.66	74	63.6	31.26	10.06	58.58	100	0	P	V
		4804	21.55	-32.45	54	-	-	-	-	-	-	A	V
													V
													V
BT CH 39 2441MHz		4882	49.75	-24.25	74	66.77	31.38	10.15	58.55	100	0	P	H
		4882	24.96	-29.04	54	-	-	-	-	-	-	A	H
		7323	41.18	-32.82	74	51.16	36.32	12.51	58.81	100	0	P	H
		7323	16.39	-37.61	54	-	-	-	-	-	-	A	H
		4882	49.79	-24.21	74	66.81	31.38	10.15	58.55	100	0	P	V
		4882	25	-29	54	-	-	-	-	-	-	A	V
		7323	41.08	-32.92	74	51.06	36.32	12.51	58.81	100	0	P	V
		7323	16.29	-37.71	54	-	-	-	-	-	-	A	V
BT CH 78 2480MHz		4960	49.65	-24.35	74	66.37	31.54	10.25	58.51	100	0	P	H
		4960	24.86	-29.14	54	-	-	-	-	-	-	A	H
		7440	41.96	-32.04	74	51.56	36.59	12.47	58.66	100	0	P	H
		7440	17.17	-36.83	54	-	-	-	-	-	-	A	H
		4960	52.37	-21.63	74	69.09	31.54	10.25	58.51	398	22	P	V
		4960	27.58	-26.42	54	-	-	-	-	-	-	A	V
		7440	42.52	-31.48	74	52.12	36.59	12.47	58.66	100	0	P	V
		7440	17.73	-36.27	54	-	-	-	-	-	-	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Emission below 1GHz

2.4GHz BT (LF)

BT	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
2.4GHz BT LF		98.04	25.99	-17.51	43.5	41.55	15.55	1.37	32.48	-	-	P	H
		146.64	27.7	-15.8	43.5	41.58	16.89	1.67	32.44	-	-	P	H
		208.74	27.96	-15.54	43.5	43.44	14.96	1.95	32.39	-	-	P	H
		533.8	29.55	-16.45	46	34.99	23.94	3.03	32.41	-	-	P	H
		878.9	32.14	-13.86	46	30.82	29.11	3.98	31.77	-	-	P	H
		958.7	34.05	-11.95	46	29.99	31.02	4.16	31.12	100	0	P	H
													H
													H
													H
													H
													H
													H
		36.75	32.28	-7.72	40	43.16	20.79	0.82	32.49	-	-	P	V
		40.8	34.21	-5.79	40	47.14	18.68	0.88	32.49	100	0	P	V
		46.2	32.4	-7.6	40	48.24	15.72	0.93	32.49	-	-	P	V
		533.8	29.06	-16.94	46	34.5	23.94	3.03	32.41	-	-	P	V
		762.7	30.22	-15.78	46	30.91	27.92	3.68	32.29	-	-	P	V
		959.4	33.36	-12.64	46	29.25	31.07	4.16	31.12	-	-	P	V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												



2.4GHz 2400~2483.5MHz
BT 2Mbps (Band Edge @ 3m)

BT	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
BT CH00 2402MHz		2383.92	43.16	-30.84	74	43.1	27.09	6.57	33.6	100	146	P	H
		2383.92	18.4	-35.6	54	-	-	-	-	-	-	A	H
	*	2402	105.26	-	-	105.13	27.13	6.59	33.59	100	146	P	H
	*	2402	80.5	-	-	-	-	-	-	-	-	A	H
													H
													H
		2317.77	42.69	-31.31	74	42.88	26.95	6.47	33.61	358	360	P	V
		2317.77	17.93	-36.07	54	-	-	-	-	-	-	A	V
	*	2402	101.04	-	-	100.91	27.13	6.59	33.59	358	360	P	V
	*	2402	76.28	-	-	-	-	-	-	-	-	A	V
													V
													V
BT CH 39 2441MHz		2379.58	43.34	-30.66	74	43.29	27.09	6.56	33.6	229	178	P	H
		2379.58	18.58	-35.42	54	-	-	-	-	-	-	A	H
	*	2441	105.62	-	-	105.31	27.27	6.62	33.58	229	178	P	H
	*	2441	80.86	-	-	-	-	-	-	-	-	A	H
		2485.51	43.19	-30.81	74	42.75	27.36	6.66	33.58	229	178	P	H
		2485.51	18.43	-35.57	54	-	-	-	-	-	-	A	H
		2334.22	43.17	-30.83	74	43.34	26.95	6.49	33.61	392	360	P	V
		2334.22	18.41	-35.59	54	-	-	-	-	-	-	A	V
	*	2441	102.31	-	-	102	27.27	6.62	33.58	392	360	P	V
	*	2441	77.55	-	-	-	-	-	-	-	-	A	V
		2492.58	42.97	-31.03	74	42.48	27.4	6.66	33.57	392	360	P	V
		2492.58	18.21	-35.79	54	-	-	-	-	-	-	A	V



BT CH 78 2480MHz	*	2480	107.77	-	-	107.34	27.36	6.65	33.58	201	179	P	H
	*	2480	83.01	-	-	-	-	-	-	-	-	A	H
		2483.72	51.39	-22.61	74	50.95	27.36	6.66	33.58	201	179	P	H
		2483.72	26.63	-27.37	54	-	-	-	-	-	-	A	H
													H
													H
	*	2480	100.96	-	-	100.53	27.36	6.65	33.58	375	360	P	V
	*	2480	76.2	-	-	-	-	-	-	-	-	A	V
		2483.56	49.5	-24.5	74	49.06	27.36	6.66	33.58	375	360	P	V
		2483.56	24.74	-29.26	54	-	-	-	-	-	-	A	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
BT 2Mbps (Harmonic @ 3m)

BT	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
BT CH 00 2402MHz		4804	45.05	-28.95	74	62.31	31.26	10.06	58.58	100	0	P	H
		4804	20.29	-33.71	54	-	-	-	-	-	-	A	H
													H
													H
		4804	46.04	-27.96	74	63.3	31.26	10.06	58.58	100	0	P	V
		4804	21.28	-32.72	54	-	-	-	-	-	-	A	V
													V
													V
BT CH 39 2441MHz		4882	47.67	-26.33	74	64.69	31.38	10.15	58.55	100	0	P	H
		4882	22.91	-31.09	54	-	-	-	-	-	-	A	H
		7323	41.45	-32.55	74	51.43	36.32	12.51	58.81	100	0	P	H
		7323	16.69	-37.31	54	-	-	-	-	-	-	A	H
		4882	49	-25	74	66.02	31.38	10.15	58.55	100	0	P	V
		4882	24.24	-29.76	54	-	-	-	-	-	-	A	V
		7323	40.56	-33.44	74	50.54	36.32	12.51	58.81	100	0	P	V
		7323	15.8	-38.2	54	-	-	-	-	-	-	A	V
BT CH 78 2480MHz		4960	48.97	-25.03	74	65.69	31.54	10.25	58.51	100	0	P	H
		4960	24.21	-29.79	54	-	-	-	-	-	-	A	H
		7440	42.82	-31.18	74	52.42	36.59	12.47	58.66	100	0	P	H
		7440	18.06	-35.94	54	-	-	-	-	-	-	A	H
		4960	52.17	-21.83	74	68.89	31.54	10.25	58.51	396	20	P	V
		4960	27.41	-26.59	54	-	-	-	-	-	-	A	V
		7440	42.79	-31.21	74	52.39	36.59	12.47	58.66	100	0	P	V
		7440	18.03	-35.97	54	-	-	-	-	-	-	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz
BT 3Mbps (Band Edge @ 3m)

BT	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
BT CH00 2402MHz		2352.42	43.01	-30.99	74	43.05	27.04	6.52	33.6	100	292	P	H
		2352.42	18.22	-35.78	54	-	-	-	-	-	-	A	H
	*	2402	104.69	-	-	104.56	27.13	6.59	33.59	100	292	P	H
	*	2402	79.9	-	-	-	-	-	-	-	-	A	H
													H
													H
		2387.805	42.66	-31.34	74	42.56	27.13	6.57	33.6	300	311	P	V
		2387.805	17.87	-36.13	54	-	-	-	-	-	-	A	V
	*	2402	100.89	-	-	100.76	27.13	6.59	33.59	300	311	P	V
	*	2402	76.1	-	-	-	-	-	-	-	-	A	V
													V
													V
BT CH 39 2441MHz		2373.14	43.37	-30.63	74	43.33	27.09	6.55	33.6	117	126	P	H
		2373.14	18.58	-35.42	54	-	-	-	-	-	-	A	H
	*	2441	104.21	-	-	103.9	27.27	6.62	33.58	117	126	P	H
	*	2441	79.42	-	-	-	-	-	-	-	-	A	H
		2493.28	43.06	-30.94	74	42.57	27.4	6.66	33.57	117	126	P	H
		2493.28	18.27	-35.73	54	-	-	-	-	-	-	A	H
		2341.36	42.67	-31.33	74	42.77	27	6.5	33.6	272	98	P	V
		2341.36	17.88	-36.12	54	-	-	-	-	-	-	A	V
	*	2441	100.37	-	-	100.06	27.27	6.62	33.58	272	98	P	V
	*	2441	75.58	-	-	-	-	-	-	-	-	A	V
		2493.77	43.31	-30.69	74	42.81	27.4	6.67	33.57	272	98	P	V
		2493.77	18.52	-35.48	54	-	-	-	-	-	-	A	V



BT CH 78 2480MHz	*	2480	103.41	-	-	102.98	27.36	6.65	33.58	100	118	P	H
	*	2480	78.62	-	-	-	-	-	-	-	-	A	H
		2483.64	50.12	-23.88	74	49.68	27.36	6.66	33.58	100	118	P	H
		2483.64	25.33	-28.67	54	-	-	-	-	-	-	A	H
													H
													H
	*	2480	100.67	-	-	100.24	27.36	6.65	33.58	300	100	P	V
	*	2480	75.88	-	-	-	-	-	-	-	-	A	V
		2483.52	48.92	-25.08	74	48.48	27.36	6.66	33.58	300	100	P	V
		2483.52	24.13	-29.87	54	-	-	-	-	-	-	A	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
BT 3Mbps (Harmonic @ 3m)

BT	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
BT CH 00 2402MHz		4804	46.18	-27.82	74	63.44	31.26	10.06	58.58	100	0	P	H
		4804	21.39	-32.61	54	-	-	-	-	-	-	A	H
													H
													H
		4804	46.69	-27.31	74	63.95	31.26	10.06	58.58	100	0	P	V
		4804	21.9	-32.1	54	-	-	-	-	-	-	A	V
													V
													V
BT CH 39 2441MHz		4882	47.76	-26.24	74	64.78	31.38	10.15	58.55	100	0	P	H
		4882	22.97	-31.03	54	-	-	-	-	-	-	A	H
		7323	42.19	-31.81	74	52.17	36.32	12.51	58.81	100	0	P	H
		7323	17.4	-36.6	54	-	-	-	-	-	-	A	H
		4882	47.78	-26.22	74	64.8	31.38	10.15	58.55	100	0	P	V
		4882	22.99	-31.01	54	-	-	-	-	-	-	A	V
		7323	41.48	-32.52	74	51.46	36.32	12.51	58.81	100	0	P	V
		7323	16.69	-37.31	54	-	-	-	-	-	-	A	V
BT CH 78 2480MHz		4960	48.81	-25.19	74	65.53	31.54	10.25	58.51	100	0	P	H
		4960	24.02	-29.98	54	-	-	-	-	-	-	A	H
		7440	42.39	-31.61	74	51.99	36.59	12.47	58.66	100	0	P	H
		7440	17.6	-36.4	54	-	-	-	-	-	-	A	H
		4960	49.7	-24.3	74	66.42	31.54	10.25	58.51	100	0	P	V
		4960	24.91	-29.09	54	-	-	-	-	-	-	A	V
		7440	41.9	-32.1	74	51.5	36.59	12.47	58.66	100	0	P	V
		7440	17.11	-36.89	54	-	-	-	-	-	-	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



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	Peak or Average
H/V	Horizontal or Vertical



A calculation example for radiated spurious emission is shown as below:

BT	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BT CH 00 2402MHz		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

1. Path Loss(dB) = Cable loss(dB) + Filter loss(dB) + Attenuator loss(dB)
2. Level(dBμV/m) =
Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)
3. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)
= Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)
= 32.22(dB/m) + 4.58(dB) + 54.51(dBμV) – 35.86 (dB)
= 55.45 (dBμV/m)
2. Over Limit(dB)
= Level(dBμV/m) – Limit Line(dBμV/m)
= 55.45(dBμV/m) – 74(dBμV/m)
= -18.55(dB)

For Average Limit @ 2390MHz:

1. Level(dBμV/m)
= Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)
= 32.22(dB/m) + 4.58(dB) + 42.6(dBμV) – 35.86 (dB)
= 43.54 (dBμV/m)
2. Over Limit(dB)
= Level(dBμV/m) – Limit Line(dBμV/m)
= 43.54(dBμV/m) – 54(dBμV/m)
= -10.46(dB)

Both peak and average measured complies with the limit line, so test result is “PASS”.



Appendix D. Radiated Spurious Emission Plots

Test Engineer :	HAO HSU and Chuan Zhu	Temperature :	21~26°C
		Relative Humidity :	52~57%

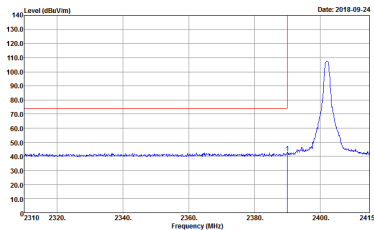
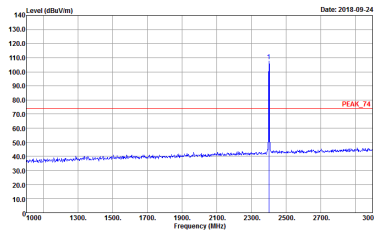
Note symbol

-L	Low channel location
-R	High channel location

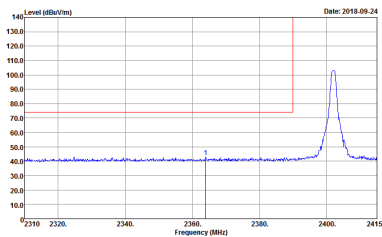
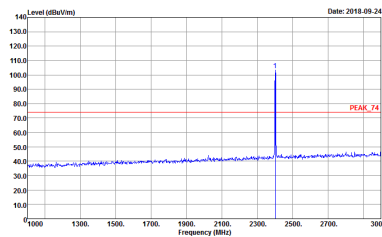


2.4GHz 2400~2483.5MHz

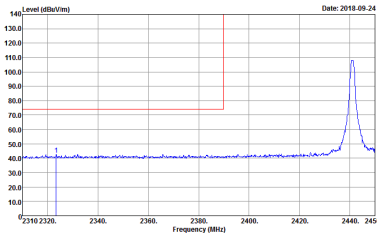
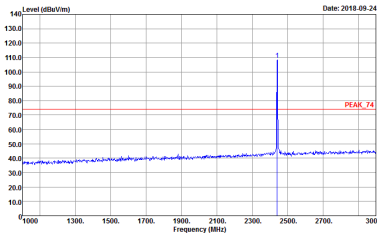
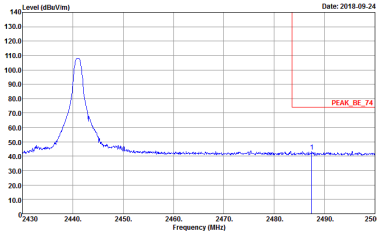
BT 1Mbps (Band Edge @ 3m)

BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BT CH00 2402MHz	
	Horizontal	Fundamental
Peak	 Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 9120D-HF HORIZONTAL Detector : Peak Project : 882920-01	 Site : 03CH11-HY Condition : PEAK_74 3m HORN 9120D-HF HORIZONTAL Detector : Peak Project : 882920-01

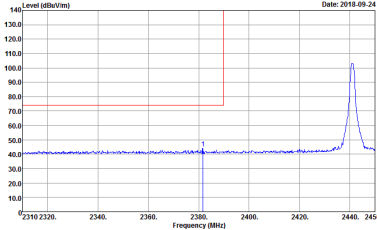
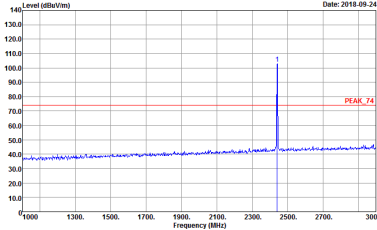
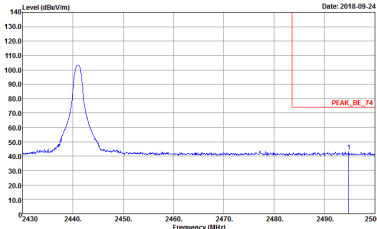


BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BT CH00 2402MHz	
	Vertical	Fundamental
Peak	 Site : 03CH11-14Y Condition : PEAK_BE_74 3m HORN 91200-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 882920-01	 Site : 03CH11-14Y Condition : PEAK_74 3m HORN 91200-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 882920-01



BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BT CH39 2441MHz	
	Horizontal	Fundamental
Peak	 Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 91200-HF HORIZONTAL Detector : Peak Project : 882920-01	 Site : 03CH11-HY Condition : PEAK_74 3m HORN 91200-HF HORIZONTAL Detector : Peak Project : 882920-01
Peak	 Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 91200-HF HORIZONTAL Detector : Peak Project : 882920-01	Left blank



BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BT CH39 2441MHz	
	Vertical	Fundamental
Peak	 Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 91200-HF VERTICAL Detector : Peak Project : 882920-01	 Site : 03CH11-HY Condition : PEAK_74 3m HORN 91200-HF VERTICAL Detector : Peak Project : 882920-01
Peak	 Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 91200-HF VERTICAL Detector : Peak Project : 882920-01	Left blank



BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BT CH78 2480MHz	
	Horizontal	Fundamental
Peak	Level (dBm/Vm) Date: 2018-09-24 2460 2463.2465.2467.2469.2471.2473.2475.2477.2479.2481.2483.2485.2487.2489.2491.2493.2495.2497. 2500 Frequency (MHz) Site : 03CH11-14Y Condition : PEAK_BE_74 3m HORN 91200-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 882920-01	Level (dBm/Vm) Date: 2018-09-24 1000 1300. 1500. 1700. 1900. 2100. 2300. 2500. 2700. 3000 Frequency (MHz) Site : 03CH11-14Y Condition : PEAK_74 3m HORN 91200-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 882920-01

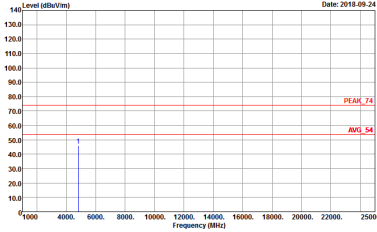
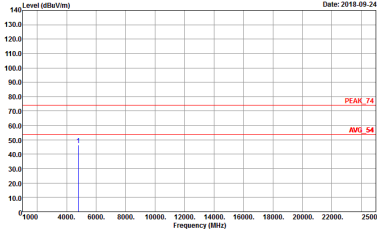


BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BT CH78 2480MHz	
	Vertical	Fundamental
Peak	Level (dBm/Vm) Date: 2018-09-24 2460 2463.2465 2467 2469 2471 2473 2475 2477 2479 2481 2483 2485 2487 2489 2491 2493 2495 2497 2500 Frequency (MHz) Site : 03CH11-14Y Condition : PEAK_BE_74 3m HORN 91200-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 882920-01	Level (dBm/Vm) Date: 2018-09-24 1000 1300 1500 1700 1900 2100 2300 2500 2700 2900 3000 Frequency (MHz) Site : 03CH11-14Y Condition : PEAK_74 3m HORN 91200-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 882920-01



2.4GHz 2400~2483.5MHz

BT 1Mbps (Harmonic @ 3m)

BT	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	BT CH00 2402MHz	
	Horizontal	Vertical
Peak Avg.	 Site : 03CH11-HY Condition : PEAK_74 3m HORN 91200-HF HORIZONTAL Detector : Peak Project : 882920-01	 Site : 03CH11-HY Condition : PEAK_74 3m HORN 91200-HF VERTICAL Detector : Peak Project : 882920-01

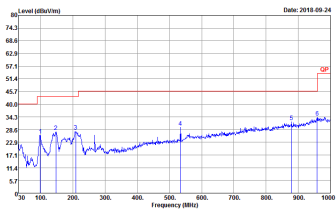
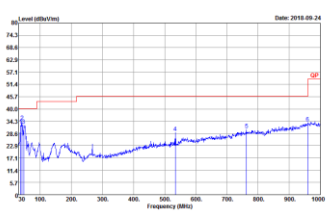


BT	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	BT CH39 2441MHz	
	Horizontal	Vertical
Peak Avg.	Level (dBuV/m) Date: 2018-09-24 Site : 03CH11-14Y Condition : PEAK_74 3m HORN 91200-HF HORIZONTAL Detector : Peak Project : 882920-01	Level (dBuV/m) Date: 2018-09-24 Site : 03CH11-14Y Condition : PEAK_74 3m HORN 91200-HF VERTICAL Detector : Peak Project : 882920-01



BT	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	BT CH78 2480MHz	
	Horizontal	Vertical
Peak Avg.	Level (dBuV/m) Date: 2018-09-24 Site : 03CH11-14Y Condition : PEAK_74 3m HORN 91200-HF HORIZONTAL Detector : Peak Project : 882920-01	Level (dBuV/m) Date: 2018-09-24 Site : 03CH11-14Y Condition : PEAK_74 3m HORN 91200-HF VERTICAL Detector : Peak Project : 882920-01

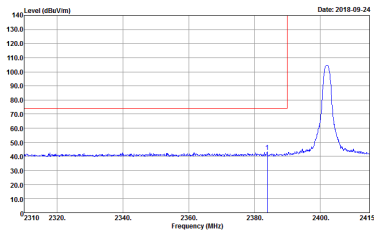
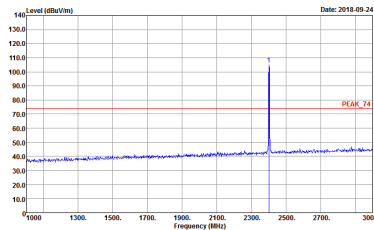
Emission below 1GHz
2.4GHz BT (LF)

BT	2.4GHz 2400~2483.5MHz	
	BT LF	
	Horizontal	Vertical
QP / Peak	 Site : 03CH11-HY Condition : QP 3m BE-LO6 6111D-LF_ETC HORIZONTAL Detector : Peak Project : 882920-01	 Site : 03CH11-HY Condition : QP 3m BE-LO6 6111D-LF_ETC VERTICAL Detector : Peak Project : 882920-01

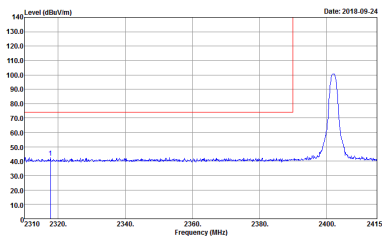
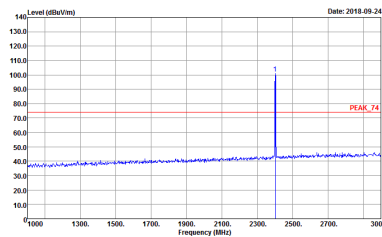


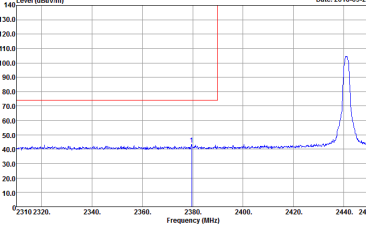
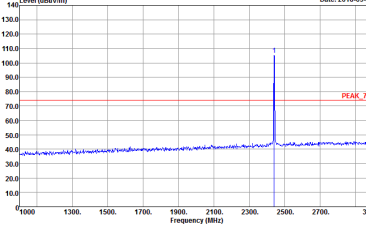
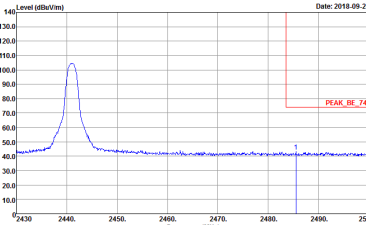
2.4GHz 2400~2483.5MHz

BT 2Mbps (Band Edge @ 3m)

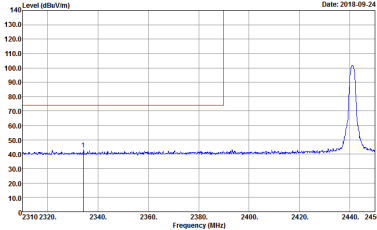
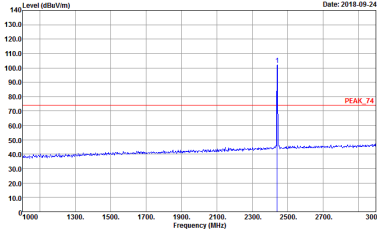
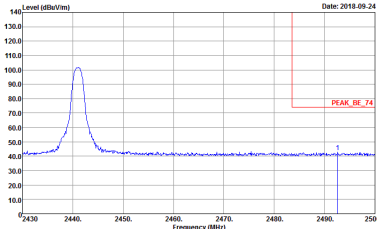
BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BT CH00 2402MHz	
	Horizontal	Fundamental
Peak	 Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 9120D-HF HORIZONTAL Detector : Peak Project : 882920-01	 Site : 03CH11-HY Condition : PEAK_74 3m HORN 9120D-HF HORIZONTAL Detector : Peak Project : 882920-01



BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BT CH00 2402MHz	
	Vertical	Fundamental
Peak	 Site : 03CH11-14Y Condition : PEAK_BE_74 3m HORN 91200-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 882920-01	 Site : 03CH11-14Y Condition : PEAK_74 3m HORN 91200-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 882920-01

BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BT CH39 2441MHz	
	Horizontal	Fundamental
Peak	 Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 91200-HF HORIZONTAL Detector : Peak Project : 882920-01	 Site : 03CH11-HY Condition : PEAK_74 3m HORN 91200-HF HORIZONTAL Detector : Peak Project : 882920-01
Peak	 Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 91200-HF HORIZONTAL Detector : Peak Project : 882920-01	Left blank



BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BT CH39 2441MHz	
	Vertical	Fundamental
Peak	 Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 91200-HF VERTICAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Project : Peak Project : 882920-01	 Site : 03CH11-HY Condition : PEAK_74 3m HORN 91200-HF VERTICAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Project : Peak Project : 882920-01
Peak	 Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 91200-HF VERTICAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Project : Peak Project : 882920-01	Left blank



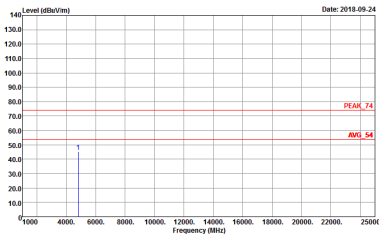
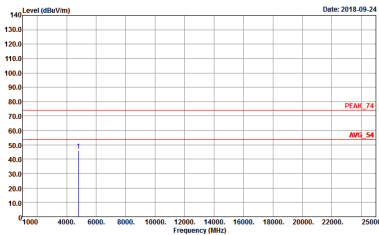
BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BT CH78 2480MHz	
	Horizontal	Fundamental
Peak	Level (dBuV/m) Date: 2018-09-24 2460 2463.2465 2467 2469 2471 2473 2475 2477 2479 2481 2483 2485 2487 2489 2491 2493 2495 2497 2500 Frequency (MHz) Site : 03CH11-14Y Condition : PEAK_BE_74 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 882920-01	Level (dBuV/m) Date: 2018-09-24 1000 1300 1500 1700 1900 2100 2300 2500 2700 2900 3000 Frequency (MHz) Site : 03CH11-14Y Condition : PEAK_74 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 882920-01



BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BT CH78 2480MHz	
	Vertical	Fundamental
Peak	Level (dBm/Vm) Date: 2018-09-24 2460 2463.2465.2467.2469.2471.2473.2475.2477.2479.2481.2483.2485.2487.2489.2491.2493.2495.2497. 2500 Frequency (MHz) Site : 03CH11-14Y Condition : PEAK_BE_74 3m HORN 91200-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 882920-01	Level (dBm/Vm) Date: 2018-09-24 1000 1300. 1500. 1700. 1900. 2100. 2300. 2500. 2700. 3000 Frequency (MHz) Site : 03CH11-14Y Condition : PEAK_74 3m HORN 91200-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 882920-01



2.4GHz 2400~2483.5MHz
BT 2Mbps (Harmonic @ 3m)

BT	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	BT CH00 2402MHz	
	Horizontal	Vertical
Peak Avg.	 Site : 03CH11-HY Condition : PEAK_74 3m HORN 91200-HF HORIZONTAL Detector : Peak Project : 882920-01	 Site : 03CH11-HY Condition : PEAK_74 3m HORN 91200-HF VERTICAL Detector : Peak Project : 882920-01



BT	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	BT CH39 2441MHz	
	Horizontal	Vertical
Peak Avg.	Level (dBuV/m) Date: 2018-09-24 Frequency (MHz) Site : 03CH11-14Y Condition : PEAK_74 3m HORN 91200-HF HORIZONTAL Detector : Peak Project : 882920-01	Level (dBuV/m) Date: 2018-09-24 Frequency (MHz) Site : 03CH11-14Y Condition : PEAK_74 3m HORN 91200-HF VERTICAL Detector : Peak Project : 882920-01

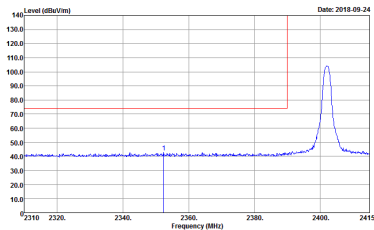
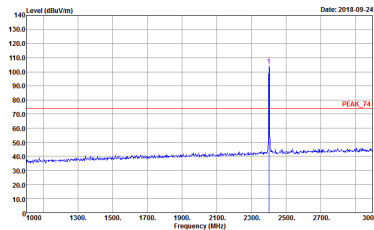


BT	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	BT CH78 2480MHz	
	Horizontal	Vertical
Peak Avg.	Level (dBuV/m) Date: 2018-09-24 Site : 03CH11-14Y Condition : PEAK_74 3m HORN 91200-HF HORIZONTAL Detector : Peak Project : 882920-01	Level (dBuV/m) Date: 2018-09-24 Site : 03CH11-14Y Condition : PEAK_74 3m HORN 91200-HF VERTICAL Detector : Peak Project : 882920-01

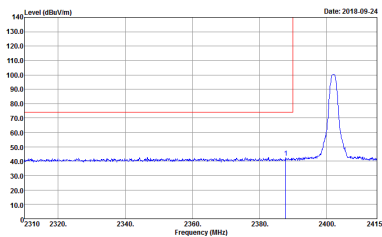
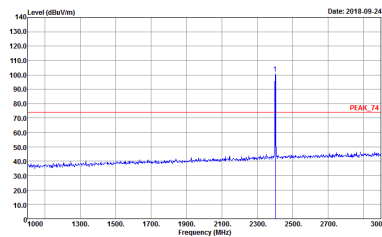


2.4GHz 2400~2483.5MHz

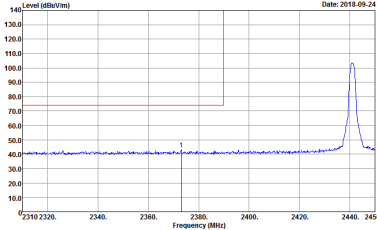
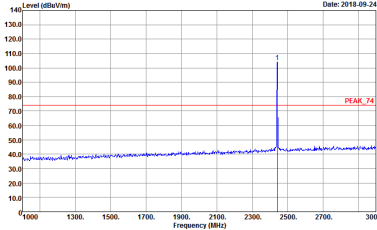
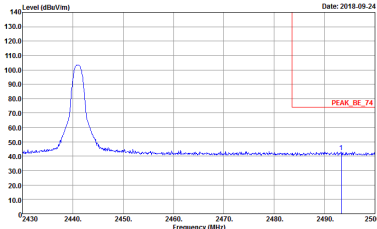
BT 3Mbps (Band Edge @ 3m)

BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BT CH00 2402MHz	
	Horizontal	Fundamental
Peak	 Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 9120D-HF HORIZONTAL Detector : Peak Project : 882920-01	 Site : 03CH11-HY Condition : PEAK_74 3m HORN 9120D-HF HORIZONTAL Detector : Peak Project : 882920-01

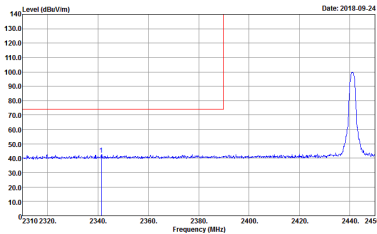
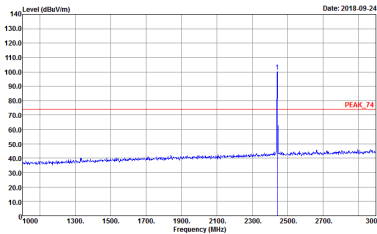
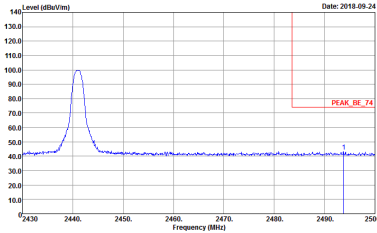


BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BT CH00 2402MHz	
	Vertical	Fundamental
Peak	 Site : 03CH11-14Y Condition : PEAK_BE_74 3m HORN 91200-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 882920-01	 Site : 03CH11-14Y Condition : PEAK_74 3m HORN 91200-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 882920-01



BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BT CH39 2441MHz	
	Horizontal	Fundamental
Peak	 Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 91200-HF HORIZONTAL Detector : Peak Project : 882920-01	 Site : 03CH11-HY Condition : PEAK_74 3m HORN 91200-HF HORIZONTAL Detector : Peak Project : 882920-01
Peak	 Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 91200-HF HORIZONTAL Detector : Peak Project : 882920-01	Left blank



BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BT CH39 2441MHz	
	Vertical	Fundamental
Peak	 Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 91200-HF VERTICAL Detector : Peak Project : 882920-01	 Site : 03CH11-HY Condition : PEAK_74 3m HORN 91200-HF VERTICAL Detector : Peak Project : 882920-01
Peak	 Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 91200-HF VERTICAL Detector : Peak Project : 882920-01	Left blank



BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BT CH78 2480MHz	
	Horizontal	Fundamental
Peak	Level (dBm/Vm) Date: 2018-09-24 2460 2463.2465 2467.2469 2471 2473.2475 2477.2479 2481.2483 2485.2487 2489 2491 2493 2495 2497 2500 Frequency (MHz) Site : 03CH11-14Y Condition : PEAK_BE_74 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 882920-01	Level (dBm/Vm) Date: 2018-09-24 1000 1300 1500 1700 1900 2100 2300 2500 2700 2900 3000 Frequency (MHz) Site : 03CH11-14Y Condition : PEAK_74 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 882920-01

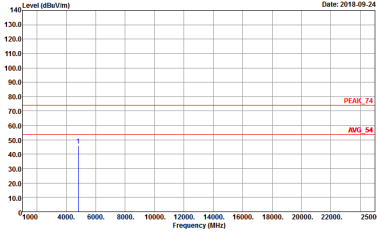
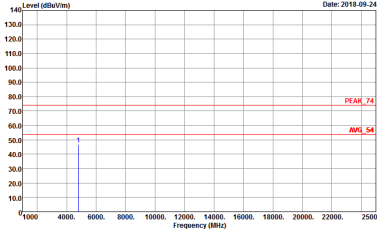


BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BT CH78 2480MHz	
	Vertical	Fundamental
Peak	Level (dBuV/m) Date: 2018-09-24 2460 2463.2465.2467.2469.2471.2473.2475.2477.2479.2481.2483.2485.2487.2489.2491.2493.2495.2497. 2500 Frequency (MHz) Site : 03CH11-14Y Condition : PEAK_BE_74 3m HORN 91200-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 882920-01	Level (dBuV/m) Date: 2018-09-24 1000 1300. 1500. 1700. 1900. 2100. 2300. 2500. 2700. 3000 Frequency (MHz) Site : 03CH11-14Y Condition : PEAK_74 3m HORN 91200-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 882920-01



2.4GHz 2400~2483.5MHz

BT 3Mbps (Harmonic @ 3m)

BT	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	BT CH00 2402MHz	
	Horizontal	Vertical
Peak Avg.	 Site : 03CH11-HY Condition : PEAK_74 3m HORN 91200-HF HORIZONTAL Detector : Peak Project : 882920-01	 Site : 03CH11-HY Condition : PEAK_74 3m HORN 91200-HF VERTICAL Detector : Peak Project : 882920-01



BT	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	BT CH39 2441MHz	
	Horizontal	Vertical
Peak Avg.	Level (dBuV/m) Date: 2018-09-24 Site : 03CH11-14Y Condition : PEAK_74 3m HORN 91200-HF HORIZONTAL Detector : Peak Project : 882920-01	Level (dBuV/m) Date: 2018-09-24 Site : 03CH11-14Y Condition : PEAK_74 3m HORN 91200-HF VERTICAL Detector : Peak Project : 882920-01



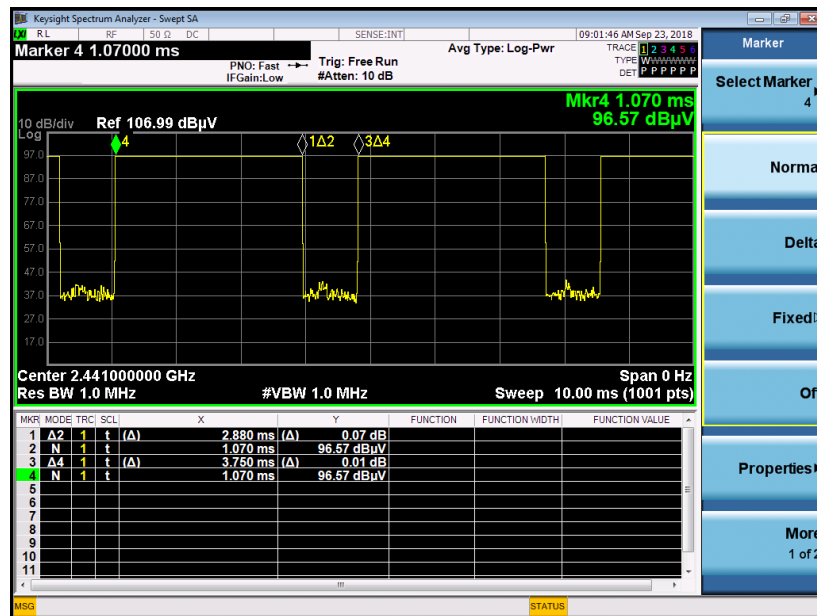
BT	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	BT CH78 2480MHz	
	Horizontal	Vertical
Peak Avg.	Level (dBuV/m) Date: 2018-09-24 Site : 03CH11-14Y Condition : PEAK_74 3m HORN 91200-HF HORIZONTAL Detector : Peak Project : 882920-01	Level (dBuV/m) Date: 2018-09-24 Site : 03CH11-14Y Condition : PEAK_74 3m HORN 91200-HF VERTICAL Detector : Peak Project : 882920-01



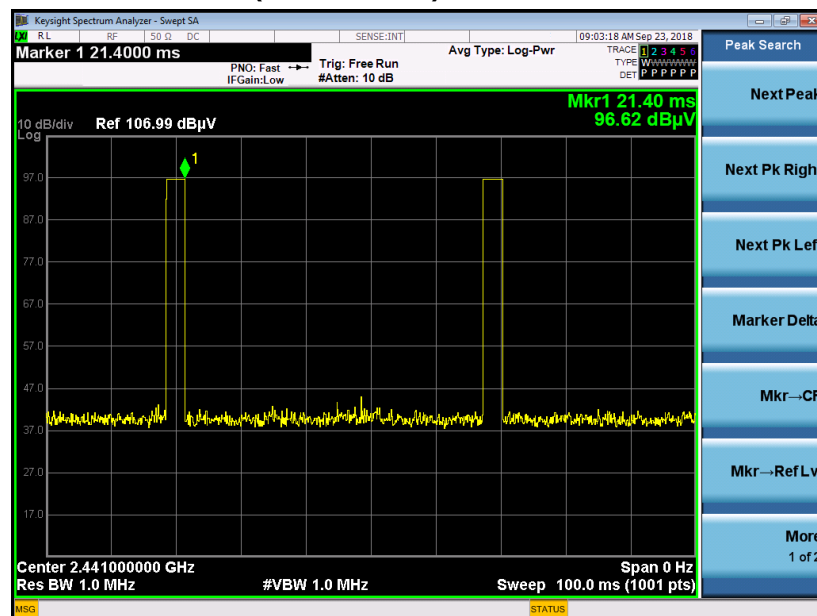
Appendix E. Duty Cycle Plots

<1Mbps>

DH5 on time (One Pulse) Plot on Channel 39



on time (Count Pulses) Plot on Channel 39

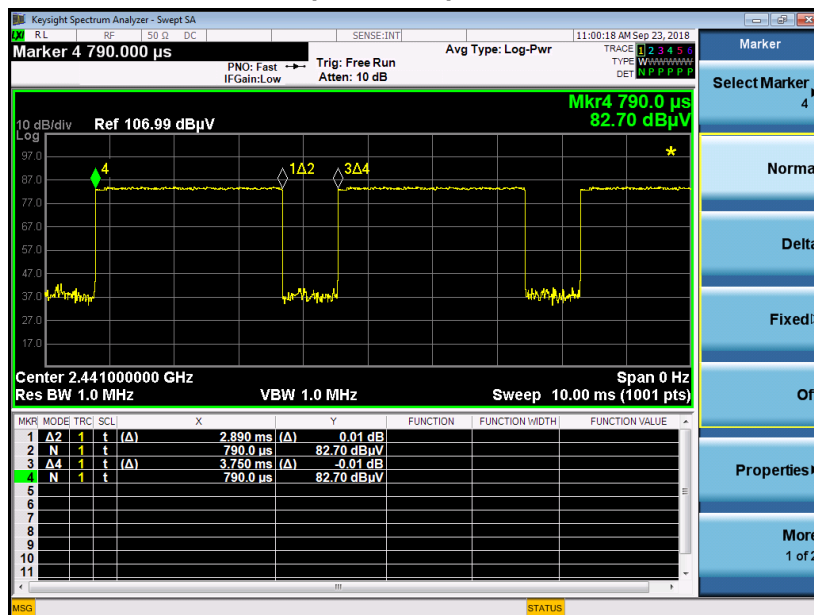
**Note:**

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

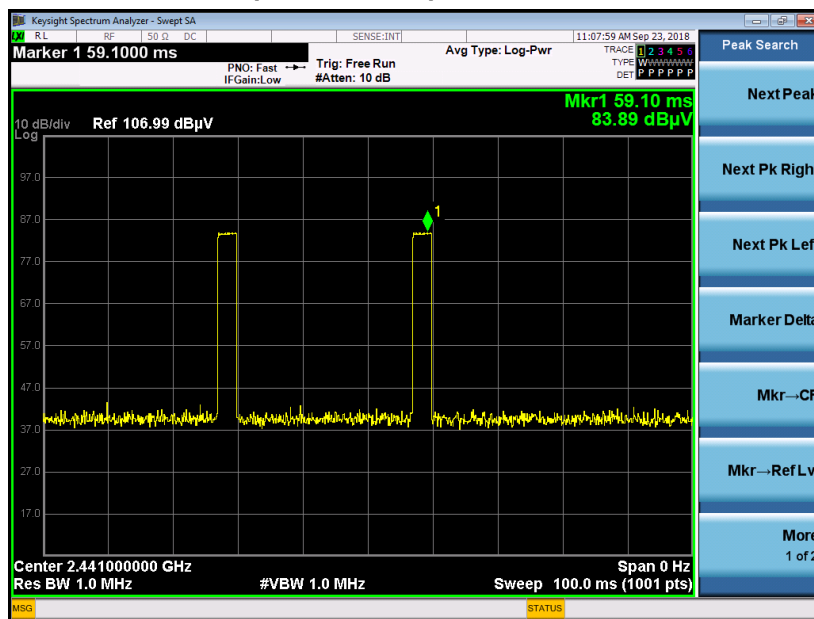


<2Mbps>

2DH5 on time (One Pulse) Plot on Channel 39



on time (Count Pulses) Plot on Channel 39



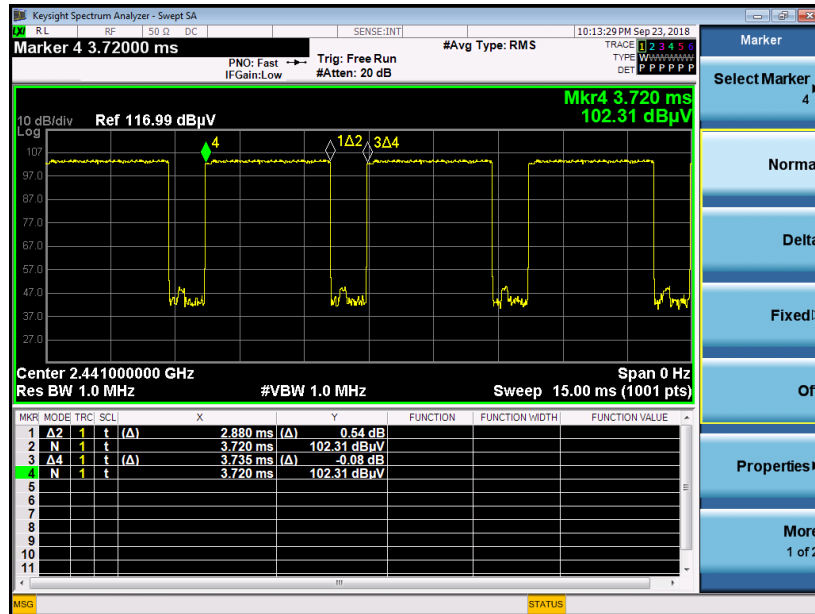
Note:

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. 2DH5 has the highest duty cycle worst case and is reported.

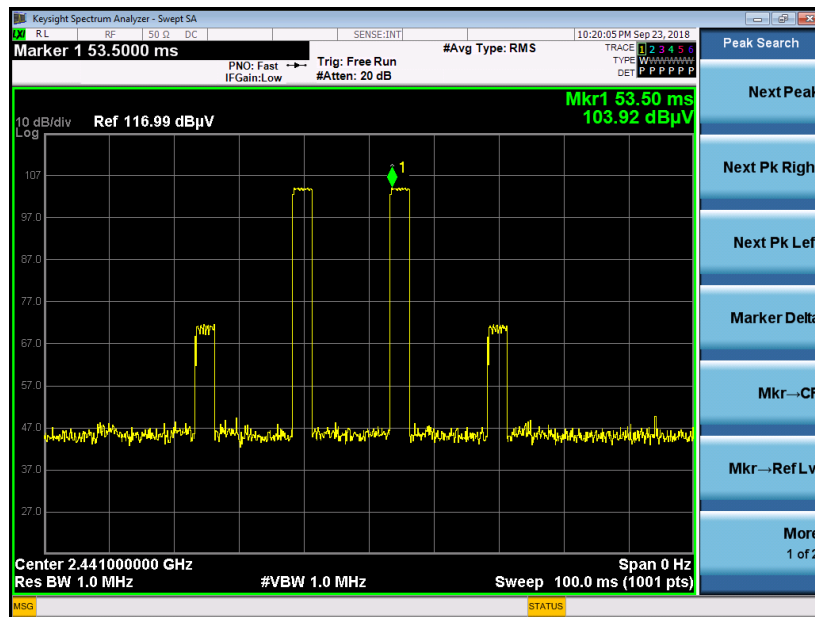


<3Mbps>

3DH5 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 = $2 * 2.88 / 100 = 5.76\%$
2. Worst case Duty cycle correction factor = $20 * \log(\text{Duty cycle}) = -24.79 \text{ dB}$
3. 3DH5 has the highest duty cycle worst case and is reported.

**Duty Cycle Correction Factor Consideration for AFH mode:**

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

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

$$2.88 \text{ ms} \times 20 \text{ channels} = 57.6 \text{ ms}$$

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. $[100\text{ms} / 57.6\text{ms}] = 2 \text{ hops}$

Thus, the maximum possible ON time:

$$2.88 \text{ ms} \times 2 = 5.76 \text{ ms}$$

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

$$20 \times \log(5.76 \text{ ms}/100\text{ms}) = -24.79 \text{ dB}$$

—————THE END—————