FCC RADIO TEST REPORT

Equipment	**:**	**bike power trainer**
Brand Name	**:**	**Xplova**
Model Name	**:**	**NOZA Nx (x：A-Z, 0-9)**
Marketing Name	**:**	**Xplova Noza bike power trainer**
Applicant	**:**	**Acer Incorporated** **8F., No. 88, Sec. 1, Xintai 5th Rd., Xizhi Dist., New Taipei City 22181, Taiwan (R.O.C)**
Manufacturer	**:**	**Xplova Inc.** **6F., No.68, Ruiguang Rd., Neihu Dist., Taipei City 114, Taiwan (R.O.C.)**
Standard	**:**	**FCC Part 15 Subpart C §15.249**

The product was received on Sep. 13, 2018 and testing was started from Oct. 16, 2018 and completed on Nov. 20, 2018. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Approved by: Joseph Lin

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory

No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)

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History of this test report

Report No.	Version	Description	Issue Date
FR891436B	01	Initial issue of report	Nov. 27, 2018

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result	Remark
2.1	15.207	AC Power Line Conducted Emissions	Complies	Under limit 15.22 dB at 2.587 MHz
2.2	2.1049	20dB & 99% Occupied Bandwidth	Complies	-
2.3	15.249(a)	Field Strength of Fundamental Emissions	Complies	Max level 87.31 dBμV/m at 2457.160MHz
2.3	15.249(a)(d)	Radiated Spurious Emissions	Complies	Under limit 11.49 dB at 39.180MHz
2.4	15.203	Antenna Requirements	Complies	-

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**2.2**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**4.9**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.8**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**3.9**

1. General Description

1.1. Product Feature of Equipment Under Test

Bluetooth and ANT+

Product Specification subjective to this standard	
Antenna Type	ANT+: PCB Antenna Bluetooth: PCB Antenna

1.2. Modification of EUT

No modifications are made to the EUT during all test items.

1.3. Table for Test Modes

Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Mode
AC Power Line Conducted Emissions	CTX
Field Strength of Fundamental Emissions	CTX
Bandwidth	CTX
Radiated Emissions	CTX

Note:

1. CTX=continuously transmitting.
2. The programmed RF utility, “SimulANT” installed in the notebook to make the EUT get into the engineering modes to continuously transmit.

Test Cases	
AC Conducted Emission	Mode 1 : Bluetooth Link + Ant+ (2570MHz) Link + Adapter 1 Mode 2 : Bluetooth Link + Ant+ (2570MHz) Link + Adapter 2
Remark: The worst case of conducted emission is mode 1; only the test data of it was reported.	

1.4. Table for Testing Locations

Test Site	SPORTON INTERNATIONAL INC.	
Test Site Location	No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978	
Test Site No.	**Sporton Site No.**	
	TH05-HY	CO05-HY

Note: The test site complies with ANSI C63.4 2014 requirement.

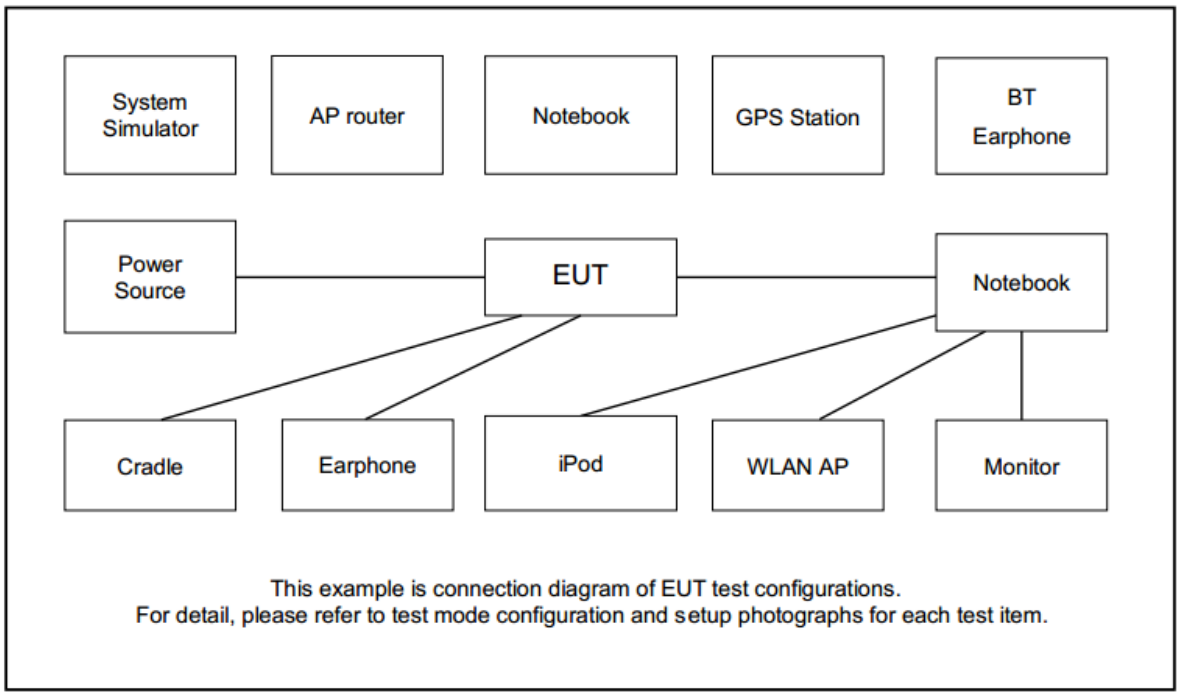
Test Site	SPORTON INTERNATIONAL INC.
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd Rd. Kwei-Shan District, Taoyuan City, Taiwan, R.O.C. TEL: +886-3-327-0868 FAX: +886-3-327-0855
Test Site No.	**Sporton Site No.**
	03CH16-HY

Note: The test site complies with ANSI C63.4 2014 requirement.

1.5. Table for Supporting Units

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Notebook	Dell	P20G	FCC DoC	N/A	AC I/P: Unshielded, 1.2m DC O/P: Shielded, 1.8m
2.	Earphone	SONY	SBH20	N/A	N/A	N/A
3.	WLAN AP	ASUS	RT-AC66U	N/A	N/A	N/A
4.	Ant + USB Receiver	N/A	N/A	N/A	N/A	N/A
5.	Mobile Phone	Apple	A1524	BCG-E2817A	N/A	N/A

1.6. Connection Diagram of Test System



2. Test Result

2.1 AC Power Line Conducted Emissions Measurement

2.1.1 Limit

For a Low-power Radio-frequency device which is designed to be connected to the 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 below limits table.

Frequency (MHz)	QP Limit (dBμV)	AV Limit (dBμV)
0.15~0.5	66~56	56~46
0.5~5	56	46
5~30	60	50

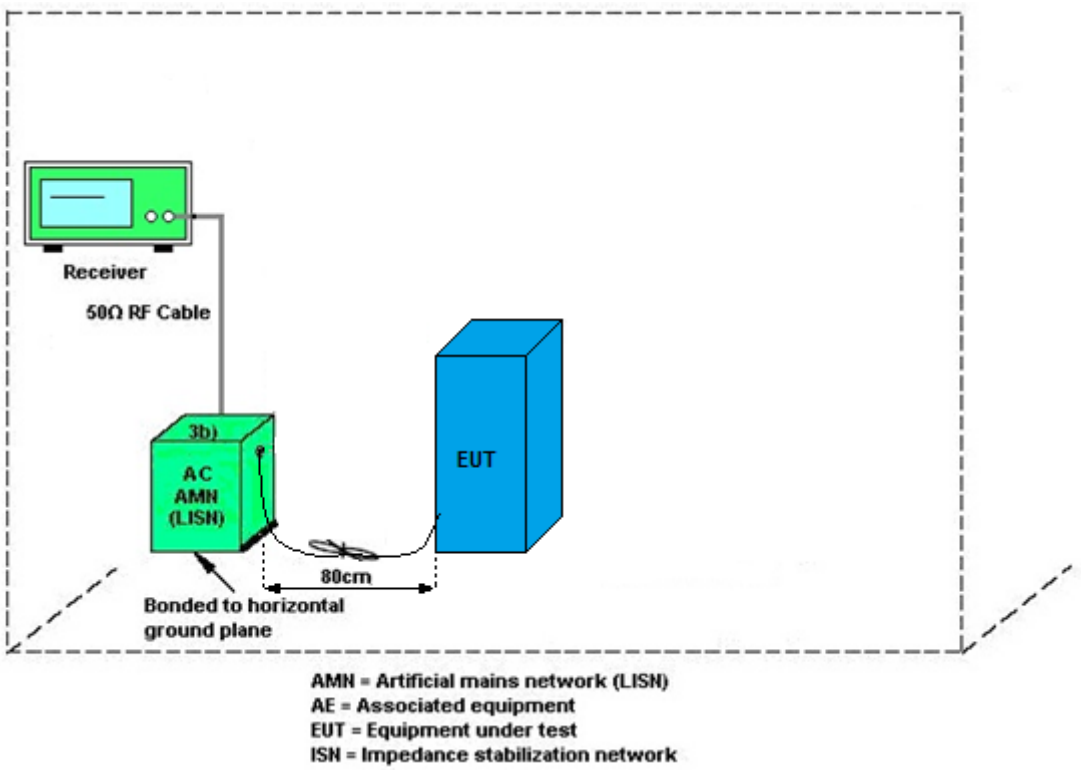
2.1.2 Measuring Instruments

Please refer to section 3 of equipment list in this report.

2.1.3 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.

2.1.4 Test Setup Layout



2.1.5 Test Deviation

There is no deviation with the original standard.

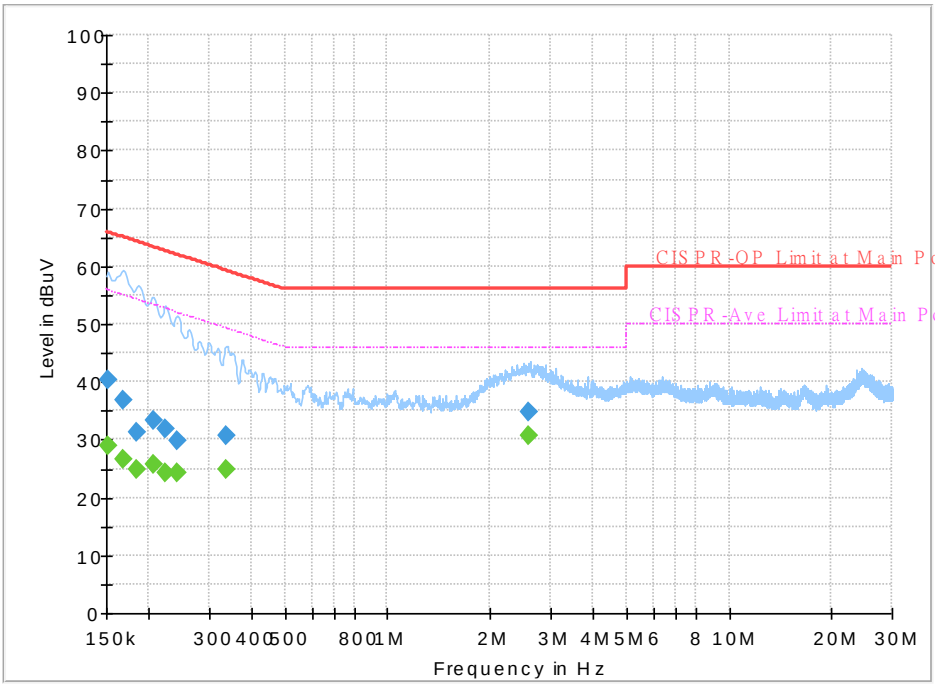
2.1.6 EUT Operation during Test

The EUT was placed on the ground and programmed in transmitting function.

2.1.7 Results of AC Power Line Conducted Emissions Measurement

Test Date	Oct. 18, 2018	Test Site No.	CO05-HY
Temperature	23~24℃	Humidity	54~55%
Test Engineer	Rick Lin	Mode	Mode 2

Line

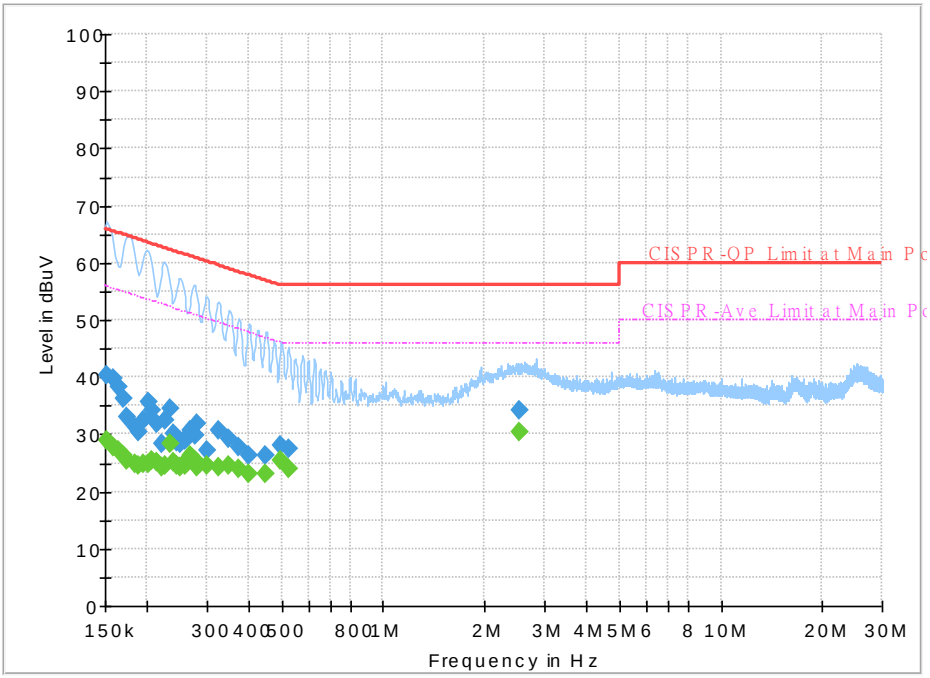


Final Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.152250	---	28.83	55.88	27.05	L1	OFF	19.5
0.152250	40.39	---	65.88	25.49	L1	OFF	19.5
0.168000	---	26.67	55.06	28.39	L1	OFF	19.5
0.168000	36.97	---	65.06	28.09	L1	OFF	19.5
0.183750	---	24.79	54.31	29.52	L1	OFF	19.5
0.183750	31.43	---	64.31	32.88	L1	OFF	19.5
0.206250	---	25.76	53.36	27.60	L1	OFF	19.5
0.206250	33.31	---	63.36	30.05	L1	OFF	19.5
0.224250	---	24.36	52.66	28.30	L1	OFF	19.5
0.224250	31.77	---	62.66	30.89	L1	OFF	19.5
0.242250	---	24.33	52.02	27.69	L1	OFF	19.5
0.242250	29.87	---	62.02	32.15	L1	OFF	19.5
0.336750	---	24.96	49.28	24.32	L1	OFF	19.5
0.336750	30.65	---	59.28	28.63	L1	OFF	19.5
2.586750	---	30.78	46.00	15.22	L1	OFF	19.6
2.586750	34.79	---	56.00	21.21	L1	OFF	19.6

Test Date	Oct. 18, 2018	Test Site No.	CO05-HY
Temperature	23~24℃	Humidity	54~55%
Test Engineer	Rick Lin	Mode	Mode 2

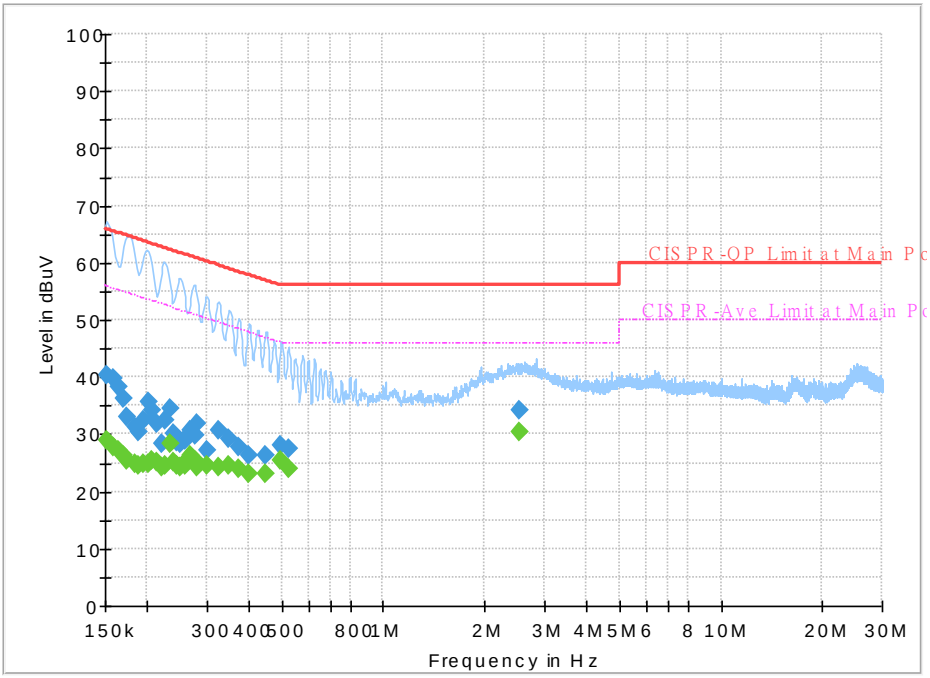
Neutral



Final Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.152250	---	29.02	55.88	26.86	N	OFF	19.5
0.152250	40.42	---	65.88	25.46	N	OFF	19.5
0.159000	---	27.71	55.52	27.81	N	OFF	19.5
0.159000	39.83	---	65.52	25.69	N	OFF	19.5
0.163500	---	27.18	55.28	28.10	N	OFF	19.5
0.163500	38.30	---	65.28	26.98	N	OFF	19.5
0.170250	---	26.22	54.95	28.73	N	OFF	19.5
0.170250	36.27	---	64.95	28.68	N	OFF	19.5
0.174750	---	25.36	54.73	29.37	N	OFF	19.5
0.174750	33.00	---	64.73	31.73	N	OFF	19.5
0.183750	---	24.83	54.31	29.48	N	OFF	19.5
0.183750	31.23	---	64.31	33.08	N	OFF	19.5
0.188250	---	24.65	54.11	29.46	N	OFF	19.5
0.188250	30.51	---	64.11	33.60	N	OFF	19.5
0.195000	---	24.77	53.82	29.05	N	OFF	19.5
0.195000	32.34	---	63.82	31.48	N	OFF	19.5
0.201750	---	24.72	53.54	28.82	N	OFF	19.5
0.201750	35.62	---	63.54	27.92	N	OFF	19.5
0.206250	---	25.35	53.36	28.01	N	OFF	19.5
0.206250	34.25	---	63.36	29.11	N	OFF	19.5

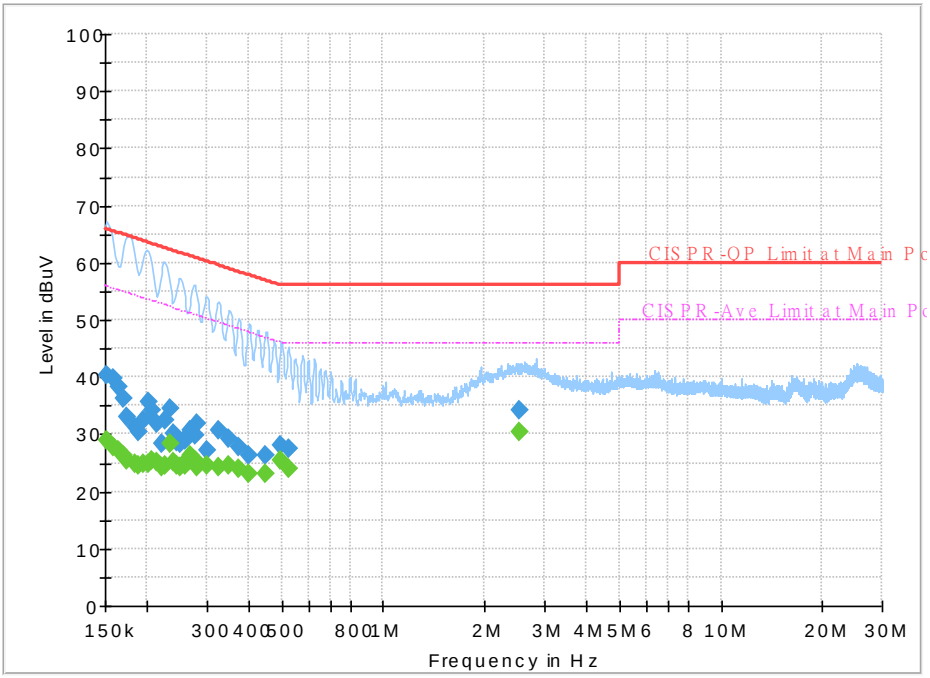
Neutral



Final Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.213000	---	25.06	53.09	28.03	N	OFF	19.5
0.213000	32.01	---	63.09	31.08	N	OFF	19.5
0.219750	---	24.31	52.83	28.52	N	OFF	19.5
0.219750	28.34	---	62.83	34.49	N	OFF	19.5
0.226500	---	24.68	52.58	27.90	N	OFF	19.5
0.226500	32.53	---	62.58	30.05	N	OFF	19.5
0.233250	---	28.43	52.33	23.90	N	OFF	19.5
0.233250	34.62	---	62.33	27.71	N	OFF	19.5
0.240000	---	25.19	52.10	26.91	N	OFF	19.5
0.240000	30.04	---	62.10	32.06	N	OFF	19.5
0.244500	---	24.47	51.94	27.47	N	OFF	19.5
0.244500	28.63	---	61.94	33.31	N	OFF	19.5
0.251250	---	24.21	51.72	27.51	N	OFF	19.5
0.251250	28.47	---	61.72	33.25	N	OFF	19.5
0.258000	---	24.56	51.50	26.94	N	OFF	19.5
0.258000	28.93	---	61.50	32.57	N	OFF	19.5
0.262500	---	25.37	51.35	25.98	N	OFF	19.5
0.262500	29.45	---	61.35	31.90	N	OFF	19.5
0.269250	---	26.45	51.14	24.69	N	OFF	19.5
0.269250	30.74	---	61.14	30.40	N	OFF	19.5
0.276000	---	25.53	50.94	25.41	N	OFF	19.5
0.276000	29.74	---	60.94	31.20	N	OFF	19.5
0.280500	---	24.39	50.80	26.41	N	OFF	19.5
0.280500	31.98	---	60.80	28.82	N	OFF	19.5
0.300750	---	24.48	50.22	25.74	N	OFF	19.5
0.300750	27.31	---	60.22	32.91	N	OFF	19.5

Neutral



Final Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.325500	---	24.35	49.57	25.22	N	OFF	19.5
0.325500	30.70	---	59.57	28.87	N	OFF	19.5
0.350250	---	24.57	48.96	24.39	N	OFF	19.5
0.350250	29.29	---	58.96	29.67	N	OFF	19.5
0.375000	---	23.97	48.39	24.42	N	OFF	19.5
0.375000	27.75	---	58.39	30.64	N	OFF	19.5
0.399750	---	23.10	47.86	24.76	N	OFF	19.5
0.399750	26.43	---	57.86	31.43	N	OFF	19.5
0.449250	---	23.22	46.89	23.67	N	OFF	19.5
0.449250	26.36	---	56.89	30.53	N	OFF	19.5
0.498750	---	25.29	46.02	20.73	N	OFF	19.5
0.498750	28.02	---	56.02	28.00	N	OFF	19.5
0.523500	---	24.11	46.00	21.89	N	OFF	19.5
0.523500	27.39	---	56.00	28.61	N	OFF	19.5
2.544000	---	30.26	46.00	15.74	N	OFF	19.6
2.544000	34.20	---	56.00	21.80	N	OFF	19.6

2.2 20dB and & 99% Occupied Bandwidth

2.2.1 Limit

Intentional radiators must be designed to ensure that the 20 dB bandwidth of the emissions in the specific band.

2.2.2 Measuring Instruments

Please refer to section 3 of equipment list in this report.

2.2.3 Test Procedures

1. The transmitter output port was connected to the spectrum analyzer.
2. Measured the spectrum width with highest power setting

2.2.4 Test Setup Layout

2.2.5 Test Deviation

There is no deviation with the original standard.

2.2.6 EUT Operation during Test

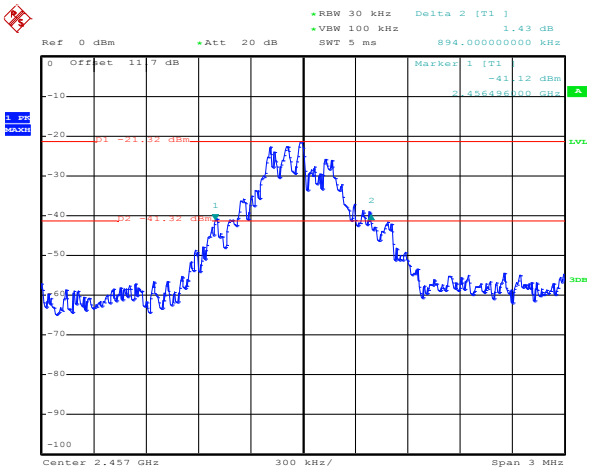
The EUT was programmed to be in continuously transmitting mode.

2.2.7 Test Result of 20dB Spectrum Bandwidth

Final Test Date	Oct. 16, 2018	Test Site No.	TH05-HY
Temperature	21~25℃	Humidity	51~54%
Test Engineer	Allen Lin		

Frequency	20dB BW (MHz)	99% OBW (MHz)
2457MHz	0.894	0.942

20 dB Bandwidth Plot on 2457MHz



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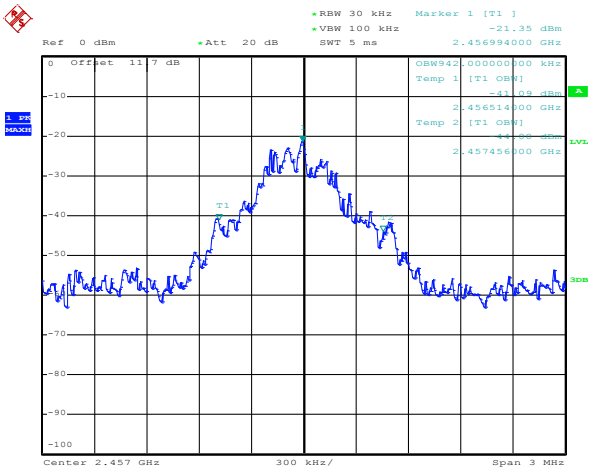
99% Bandwidth Plot on 2457MHz



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2.3 Field Strength of Fundamental Emissions and Radiated Spurious Emissions

2.3.1 Limit

The field strength measured at 3 meters shall not exceed the limits in the following table:

Fundamental Frequencies(MHz)	Field Strength(millivolts/m)	
	Fundamental	Harmonics
2400~2483.5	50	500
5725~5875	50	500
24000-24250	250	2500

Measurement instrumentation employing an average detector. The provisions in Section 5.14 for limiting peak emissions apply.

The fundamental frequency of any low-power radio-frequency devices are restricted in any of the operation bands listed below; The spurious emissions are permitted in any of frequency band listed below and shall meet the field strength requirement of LP0002 Section1.8 limit.

Except higher limit as specified elsewhere in other section, the emissions from the low-power radio-frequency devices shall not exceed the field strength levels specified in the following table and the level of any unwanted emissions shall not exceed the level of the fundamental emission. The tighter limit applies at the band edges.

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

2.3.2 Measuring Instruments

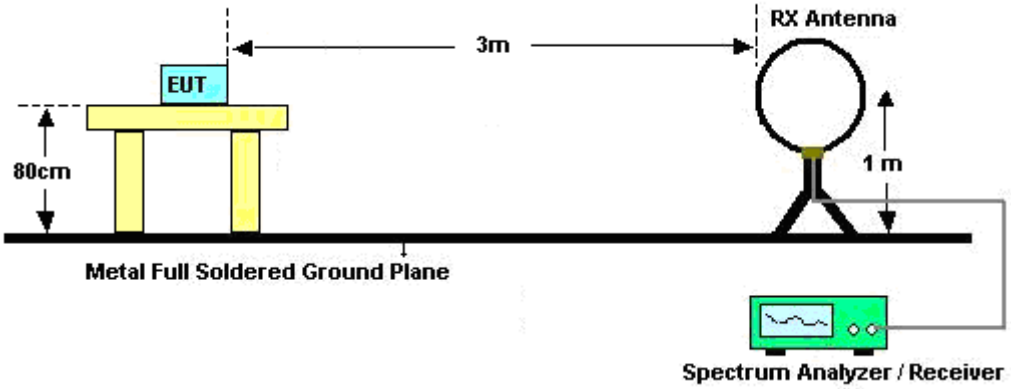
Please refer to section 3 of equipment list in this report.

2.3.3 Test Procedures

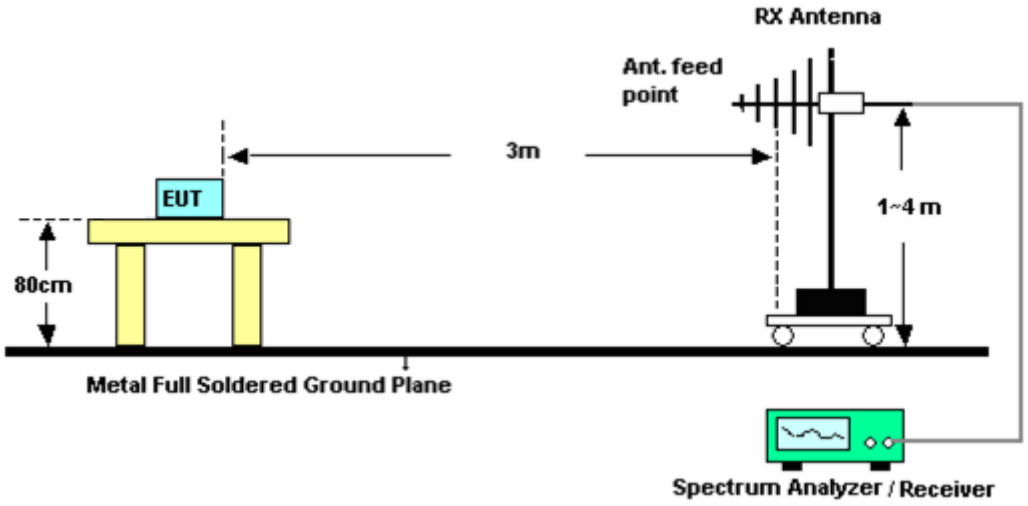
1. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. For each suspected emission, 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. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
7. Use the following spectrum analyzer settings:
   (1) Span shall wide enough to fully capture the emission being measured;
   (2) Set RBW=120 kHz for f < 1 GHz; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold;
   (3) Set RBW = 1 MHz, VBW= 3MHz for f ≥ 1 GHz for peak measurement.
   For average measurement: VBW = 10 Hz.

2.3.4 Test Setup Layout

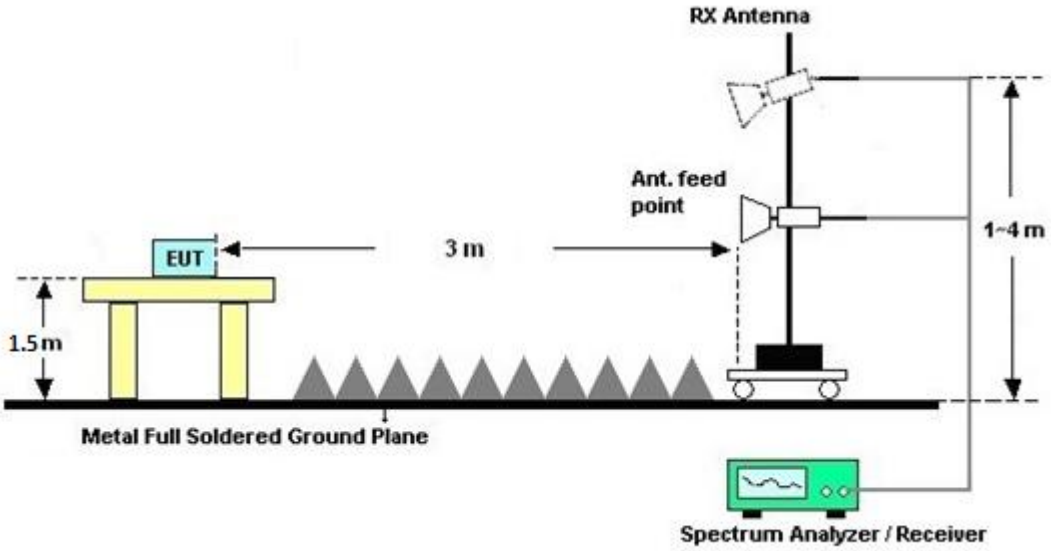
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



2.3.5 Test Deviation

There is no deviation with the original standard.

2.3.6 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

2.3.7 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 per NCC LP0002 section 5.13 was not reported.

2.3.8 Result of Field Strength of Fundamental Emissions and Spurious Emissions

Please refer to Appendix A and B

2.4 Antenna Requirements

2.4.1 Limit

Except for special regulations, the Low-power Radio-frequency Devices must not be equipped with any jacket for installing an antenna with extension cable. An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. 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 provisions of this Section. The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited.

2.4.2 Antenna Connector Construction

Enbedded in Antenna.

3. List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	Rohde & Schwarz	FSV 30	100895	9kHz~30GHz	Apr. 20, 2018	Oct. 16, 2018	Apr. 19, 2019	Conducted (TH05-HY)
Switch Box & RF Cable	Burgeon	ETF-058	EC1300484	N/A	Mar. 01, 2018	Oct. 16, 2018	Feb. 28, 2019	Conducted (TH05-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Oct. 18, 2018	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102388	9KHz~3.6GHz	Dec. 08, 2017	Oct. 18, 2018	Dec. 07, 2018	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Nov. 30, 2017	Oct. 18, 2018	Nov. 29, 2018	Conduction (CO05-HY)
Software	Rohde & Schwarz	EMC32 V10.30	N/A	N/A	N/A	Oct. 18, 2018	N/A	Conduction (CO05-HY)
LF Cable	HUBER + SUHNER	RG-214/U	LF01	N/A	Jan. 03, 2018	Oct. 18, 2018	Jan. 02, 2019	Conduction (CO05-HY)
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100851	N/A	Jan. 03, 2018	Oct. 18, 2018	Jan. 02, 2019	Conduction (CO05-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Nov. 23, 2017	Nov. 14, 2018~ Nov. 20, 2018	Nov. 22, 2018	Radiation (03CH16-HY)
Amplifier	SONOMA	310N	371607	9kHz~1000MHz	Oct. 02, 2018	Nov. 14, 2018~ Nov. 20, 2018	Oct. 01, 2019	Radiation (03CH16-HY)
Bilog Antenna	TESEQ	CBL6111D&00802N1D01N-06	47020&06	30MHz to 1GHz	Oct. 13, 2018	Nov. 14, 2018~ Nov. 20, 2018	Oct. 12, 2019	Radiation (03CH16-HY)
EMI Test Receiver	Keysight	N9038A (MXE)	MY54130085	20Hz ~ 8.4GHz	Nov. 01, 2018	Nov. 14, 2018~ Nov. 20, 2018	Oct. 31, 2019	Radiation (03CH16-HY)
Spectrum Analyzer	Agilent	E4446A	MY50180136	3Hz~44GHz	Apr. 25, 2018	Nov. 14, 2018~ Nov. 20, 2018	Apr. 24, 2019	Radiation (03CH16-HY)
Preamplifier	Jet-Power	JPA0118-55-303	1710001800054001	1GHz~18GHz	Apr. 16, 2018	Nov. 14, 2018~ Nov. 20, 2018	Apr. 15, 2019	Radiation (03CH16-HY)
Preamplifier	Keysight	83017A	MY53270264	1GHz ~ 26.5GHz	Dec. 05, 2017	Nov. 14, 2018~ Nov. 20, 2018	Dec. 04, 2018	Radiation (03CH16-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1522	1G~18GHz	Sep. 07, 2018	Nov. 14, 2018~ Nov. 20, 2018	Sep. 06, 2019	Radiation (03CH16-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY9837/4PE	9kHz-30MHz	Mar. 14, 2018	Nov. 14, 2018~ Nov. 20, 2018	Mar. 13, 2019	Radiation (03CH16-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 126E	MY1082/26EA	30M~18GHz	Oct. 16, 2018	Nov. 14, 2018~ Nov. 20, 2018	Oct. 15, 2019	Radiation (03CH16-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	505134/2	30M~40GHz	Oct. 16, 2018	Nov. 14, 2018~ Nov. 20, 2018	Oct. 15, 2019	Radiation (03CH16-HY)
Antenna Mast	ChainTek	MBS-520-1	N/A	1m~4m	N/A	Nov. 14, 2018~ Nov. 20, 2018	N/A	Radiation (03CH16-HY)
Turn Table	ChainTek	T-200-S-1	N/A	0~360 Degree	N/A	Nov. 14, 2018~ Nov. 20, 2018	N/A	Radiation (03CH16-HY)
Software	AUDIX	E3 6.2009-8-24	RK001136	N/A	N/A	Nov. 14, 2018~ Nov. 20, 2018	N/A	Radiation (03CH16-HY)
Filter	Wainwright	WHKX12-2700-3000-18000-60SS	SN2	3G High Pass	Jul. 16, 2018	Nov. 14, 2018~ Nov. 20, 2018	Jul. 15, 2019	Radiation (03CH16-HY)

Appendix A. Radiated Spurious Emission

Test Engineer :	CR Liao and J.C. Liang	Temperature :	22~25°C
		Relative Humidity :	50~54%

<With Adapter 1>

2.4GHz 2400~2483.5MHz

ANT+ (Band Edge @ 3m)

ANT+	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)
ANT+ 2457MHz		2392.72	48.21	-25.79	74	42.56	27.24	8.4	29.99	140	295	P	H
	*	2457	86.92	-27.08	114	81.05	27.4	8.44	29.97	140	295	P	H
		2485	47.55	-26.45	74	41.6	27.46	8.46	29.97	140	295	P	H
		2397.16	33.77	-20.23	54	28.1	27.25	8.41	29.99	140	295	A	H
	*	2457	66.27	-27.73	94	60.4	27.4	8.44	29.97	140	295	A	H
		2492.08	34.23	-19.77	54	28.24	27.48	8.47	29.96	140	295	A	H
		2382.04	46.46	-27.54	74	40.85	27.22	8.38	29.99	125	165	P	V
	*	2457.16	87.31	-26.69	114	81.44	27.4	8.44	29.97	125	165	P	V
		2489.68	47.37	-26.63	74	41.4	27.48	8.46	29.97	125	165	P	V
		2397.76	33.79	-20.21	54	28.12	27.25	8.41	29.99	125	165	A	V
	*	2457	66.73	-27.27	94	60.86	27.4	8.44	29.97	125	165	A	V
		2491.6	34.2	-19.8	54	28.23	27.48	8.46	29.97	125	165	A	V

2.4GHz 2400~2483.5MHz

ANT+ (Harmonic @ 3m)

ANT+	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)
ANT+ 2457MHz		4914	41.25	-32.75	74	54.43	31.43	13.4	58.52	100	0	P	H
		7371	55.95	-18.05	74	63.47	36.24	14.86	58.92	200	140	P	H
		7371	36.57	-17.43	54	44.09	36.24	14.86	58.92	200	140	A	H
													H
		4914	43.18	-30.82	74	56.36	31.43	13.4	58.52	100	0	P	V
		7371	49.98	-24.02	74	57.5	36.24	14.86	58.92	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Emission below 1GHz

ANT+ (LF)

ANT+	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
ANT+ 2457MHz LF		93.99	25.08	-18.42	43.5	41.02	15.42	1	32.38	-	-	P	H
		130.71	19.86	-23.64	43.5	32.89	18.01	1.27	32.36	-	-	P	H
		241.95	20.59	-25.41	46	32.63	18.15	2.12	32.38	-	-	P	H
		472.9	24.25	-21.75	46	29.78	23.81	3.18	32.56	-	-	P	H
		695.5	29.21	-16.79	46	31.11	26.55	3.96	32.54	-	-	P	H
		809.6	31.24	-14.76	46	30.92	28.22	4.24	32.3	100	0	P	H
													H
													H
													H
													H
													H
													H
		58.08	20.46	-19.54	40	39.23	12.62	1.01	32.42	-	-	P	V
		132.33	22.83	-20.67	43.5	35.83	18.02	1.29	32.36	-	-	P	V
		271.38	19.69	-26.31	46	30.35	19.38	2.29	32.41	-	-	P	V
		500.2	24.65	-21.35	46	29.54	24.4	3.24	32.58	-	-	P	V
		704.6	28.23	-17.77	46	29.93	26.69	4	32.52	-	-	P	V
		886.6	31.33	-14.67	46	29.61	28.92	4.5	31.86	100	0	P	V
													V
													V
													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												

<With Adapter 2>

Emission below 1GHz

2.4GHz ANT+ (LF)

ANT+	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)
2.4GHz ANT+ LF		103.17	21.42	-22.08	43.5	36.18	16.53	1.08	32.37	-	-	P	H
		158.52	16.41	-27.09	43.5	29.99	17.24	1.54	32.36	-	-	P	H
		269.22	16.89	-29.11	46	27.54	19.4	2.36	32.41	-	-	P	H
		537.3	25.21	-20.79	46	29.61	24.7	3.52	32.62	-	-	P	H
		745.9	28.58	-17.42	46	28.93	27.61	4.49	32.45	-	-	P	H
		880.3	31.13	-14.87	46	29.49	28.88	4.66	31.9	100	0	P	H
													H
													H
													H
													H
													H
													H
		39.18	28.51	-11.49	40	39.52	20.98	0.45	32.44	100	0	P	V
		85.08	21.42	-18.58	40	38.48	14.4	0.93	32.39	-	-	P	V
		156.63	21.08	-22.42	43.5	34.6	17.31	1.53	32.36	-	-	P	V
		509.3	24.64	-21.36	46	29.41	24.47	3.35	32.59	-	-	P	V
		709.5	28.53	-17.47	46	30.05	26.82	4.17	32.51	-	-	P	V
		850.9	31.53	-14.47	46	30.23	28.71	4.66	32.07	-	-	P	V
													V
													V
													V
													V
													V
													V

Remark

1. No other spurious found.
2. All results are PASS against 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	**P**eak or **A**verage
H/V	**H**orizontal or **V**ertical

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

BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BLE 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 B. Radiated Spurious Emission Plots

Test Engineer :	CR Liao and J.C. Liang	**Temperature :**	22~25°C
		Relative Humidity :	50~54%

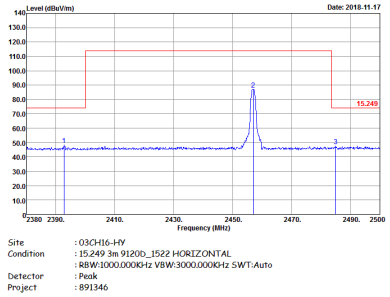
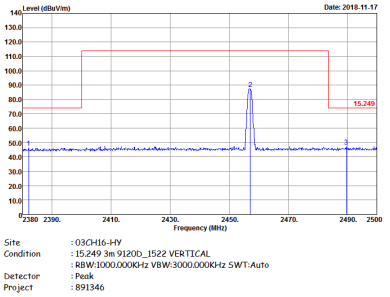
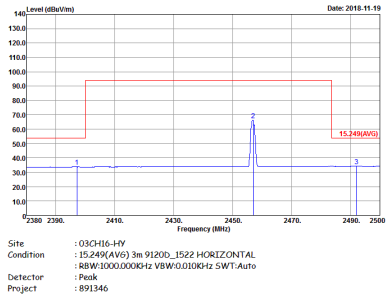
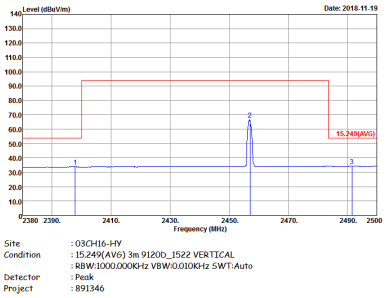
Note symbol

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

<With Adapter 1>

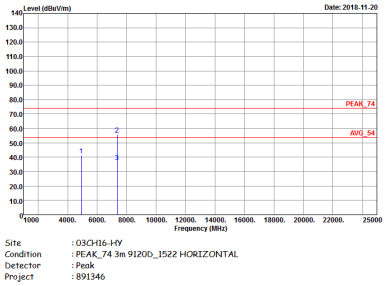
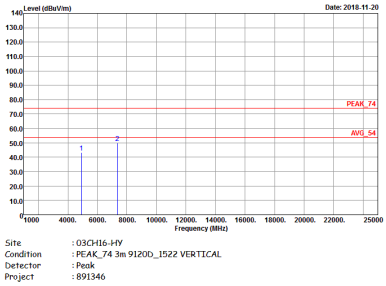
2.4GHz 2400~2483.5MHz

ANT+ (Fundamental and Band Edge @ 3m)

ANT+	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	ANT 2457MHz	
1	Horizontal	Vertical
Peak		
Avg.		

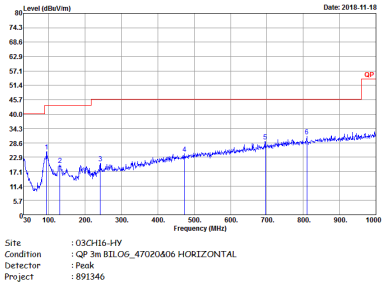
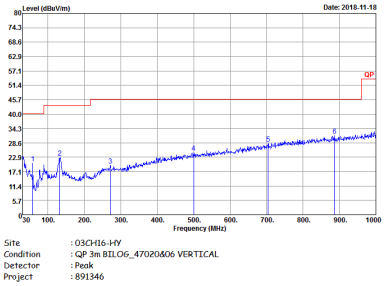
2.4GHz 2400~2483.5MHz

ANT+ (Harmonic @ 3m)

ANT+	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	ANT+ 2457MHz	
1	Horizontal	Vertical
Peak Avg.		

Emission below 1GHz

2.4GHz ANT+ (LF)

ANT+	2.4GHz 2400~2483.5MHz	
ANT	ANT+ 2457MHz	
1	Horizontal	Vertical
QP / Peak		

<With Adapter 2>

Emission below 1GHz

2.4GHz ANT+ (LF)

ANT+	2.4GHz 2400~2483.5MHz	
ANT	ANT+ 2457MHz	
1	Horizontal	Vertical
QP / Peak