

FCC Part 15.247 RF SPURIOUS EMISSION TEST REPORT



Test Report Number.....	BPT-18080801-FCC-SpuriousEmission Rev1.1
Applicant.....	Branchpoint Technologies
Applicant Address.....	1 Technology Dr., Ste I-811, Irvine, CA 92618 USA
Product Name.....	Bluetooth Smart Module
Model Number.....	EC-0137/PAN1740
Host Product/Model.....	AURA™ Antenna / T-0010
FCC ID.....	2AJW602
Date of EUT received.....	08/08/2018
Date of Test.....	08/08/2018
Report Issue Date.....	09/07/2018
Test Standards.....	47CFR Part 15.247: 2018 47CFR Part 18: 2018
Test Result.....	Pass

Issued By:

Vista Laboratories, Inc.

1261 Puerta Del Sol, San Clemente, CA 92673 USA

www.vista-compliance.com

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Tested by:

David Zhang/Test Engineer

Approved By:

Jerry Bai/Quality Manager

Report Number:	BPT-18080801-FCC-SpuriousEmission Rev1.1
Product:	Bluetooth Smart Module
Model Number:	EC-0137/PAN1740



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San Clemente, CA

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Presented this 21st day of June 2018.


President and CEO
For the Accreditation Council
Certificate Number 4848.01
Valid to July 31, 2020

For the tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.



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REVISION HISTORY

Revision	Issue Date	Description	Note
Original	08/13/2018	Original release	N/A
Rev1.0	09/07/2018	Update the FCC ID and model number	N/A
Rev1.1	09/17/2018	Remove setup pictures for confidentiality	N/A

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1 General Information

1.1 Applicant

Applicant:	Branchpoint Technologies
Applicant address:	1 Technology Dr., Ste I-811, Irvine, CA 92618
Manufacturer:	Branchpoint Technologies
Manufacturer Address:	1 Technology Dr., Ste I-811, Irvine, CA 92618

1.2 Product information

Product Name	Bluetooth Smart Module
Model Number	EC-0137/PAN1740
Host Product/Model Number	AURA™ Antenna / T-0010
Serial Number	N/A
Frequency Band	BLE: 2402-2480MHz
Type of modulation	GFSK
Equipment Class/ Category	DTS
Number of channels	40
Channel Spacing	2MHz
Maximum output power	0 dBm
Antenna Information	Integrated single antenna (Yageo antenna model: ANT2012) Antenna Gain: 0.9 dBi
Clock Frequencies	N/A
Port/Connectors	N/A
Input Power	3.3VDC
Power Adapter Manu/Model	N/A
Power Adapter SN	N/A
Hardware version	02
Software version	02
Simultaneous Transmission	Simultaneous Transmission with Part18 transmitter at 13.56MHz
Additional Info	See following for host product introduction

Host product introduction

The host is a wireless power transfer device (WPT device) operating at 13.56 MHz. It is part of the Branchpoint AURA™ Intracranial Monitor System which is a medical device system that acquires and processes intracranial pressure. The built-in Bluetooth Smart Module is to collect data from the AURA™ ICP Sensor on the 2.4 GHz band and transmit that data to the AURA™ Monitor Handheld through a cable. The BLE module is integrated as recommended by the manufacturer, and uses the certified chip antenna without modification.

The AURA™ Antenna is powered by the AURA™ Monitor Handheld on a cable permanently affixed to the AURA™ Antenna and detachable from the AURA™ Monitor Handheld. The AURA™ Monitor Handheld regulates voltage from a custom Li-ion battery back to power the AURA™ Antenna.

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1.3 Test standard and method

Test standard	47CFR Part 15.247: 2018 47CFR Part 18: 2018
Test method	ANSI C63.10: 2013 558074 D01 DTS Meas Guidance v04 (April 5, 2017) FCC/OET MP-5

1.4 Test purpose and statement

The testing in this report is spurious emissions measurements to evaluate the integration of the Bluetooth Smart module in the host product (AURA Antenna / T-0010), in which it simultaneously transmits with a FCC Part 18 13.56MHz Wireless Power transmitter. This test report demonstrates compliance of the Bluetooth Smart module to FCC rule part 47CFR 15.247:2018 while in the simultaneous transmission mode with the FCC rule part 47CFR18:2018 emitter. Based on our test results, we conclude that the product tested complies with the requirements of the standards indicated

2 Test site information

Lab performing tests	Vista Laboratories, Inc.
Lab Address	1261 Puerta Del Sol, San Clemente, CA 92673 USA
Phone Number	+1 (949) 393-1123
Website	www.Vista-compliance.com

Test condition	Test Engineer	Test Environment	Test Date
Radiated measurement	David Zhang	23.5°C / 58.2%/996 mbar	08/08/2018

3 Modification of EUT

None

4 Test configuration and operation

4.1 EUT test configuration

EUT is integrated into the host: AURA™ Antenna, and co-located with the 13.56MHz transmitter which is a wireless power transfer device (WPT device). The AURA™ Monitor Handheld is included in the test setup as supporting equipment to provide power to AURA™ Antenna. The BLE is set to continuous transmission mode at low, mid and high channel.

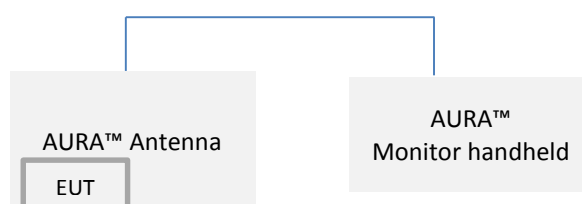
4.2 EUT test mode

Radio	Channel	Data Rates	Frequency (MHz)
BLE	1 (Low)	1 Mbps	2402
BLE	20 (Mid)	1 Mbps	2442
BLE	40 (High)	1 Mbps	2480

4.3 Supporting equipment

Index	Description	Model	S/N	Brand	Remark
1	AURA™ Antenna	T-0010	RD-0096	Branchpoint	with BLE test software installed
2	AURA™ Monitor Handheld	A-0092	A-0092-01	Branchpoint	to power the EUT
3	Battery	T-0032	BT16040509_01	Branchpoint	Fully charged

4.4 EUT setup diagram



4.5 EUT operation

Manufacturer test software is used to set EUT into continuous RF TX mode.

4.6 Test software

Index	Description	Remark
1	EMISoft Vasona 6.0049	EMC/Spurious emission test software used during testing

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5 EUT and test setup pictures

5.1 EUT pictures

Photos of Bluetooth Smart Module not included in this test report. Refer to the modular FCC filing.

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5.2 EUT test setup pictures

Setup photos are not included in this test report for confidentiality purpose. Refer to FCC filing detail.

6 Test Summary

FCC Rules	Test Item	Test standard	Section in report	Verdict
§15.203	Antenna Requirement	47CFR Part 15.247	N/A	N/A ¹⁾
§15.247 (a)(2)	DTS (6 dB) Channel Bandwidth	47CFR Part 15.247	N/A	N/A ¹⁾
§15.247(b)(3)	Conducted Maximum Output Power	47CFR Part 15.247	N/A	N/A ¹⁾
§15.247(e)	Power Spectral Density	47CFR Part 15.247	N/A	N/A ¹⁾
§15.247(d)	Conducted Band-Edge & Unwanted Emissions	47CFR Part 15.247	N/A	N/A ¹⁾
§15.207 (a)	AC Power Line Conducted Emissions	47CFR Part 15.247	N/A	N/A ¹⁾
§15.205, §15.209, §15.247(d) §18.305(b)	Radiated Spurious Emissions	47CFR Part 15.247 47CFR Part 18.305	8.1	Pass

Note:

- 1) N/A: not evaluated for this spurious emissions test addressing simultaneous transmission in this specific host device. Full compliance information for the module is contained in the full FCC report.



7 Uncertainty of Measurement

Test item	Measurement Uncertainty (dB)
Radiated Emission (30MHz-1GHz)	±4.6 dB
Radiated Emission (1-18GHz)	±4.9 dB
Radiated Emission (18-40GHz)	±3.5 dB

8 Test summary and result

8.1 Radiated spurious emissions measurement

8.1.1 Requirement in FCC Part 15

Per § 15.247 (d), in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

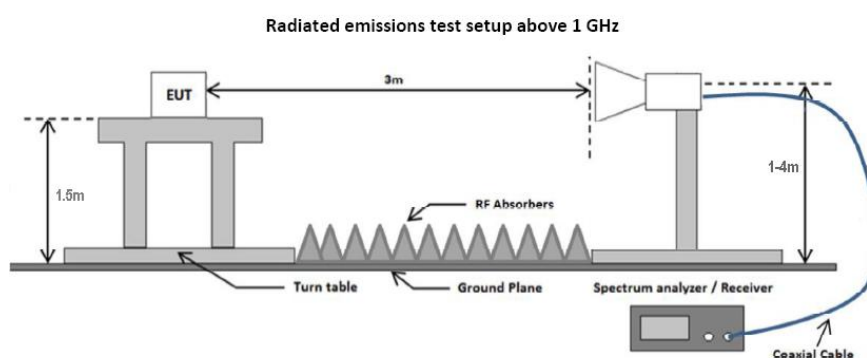
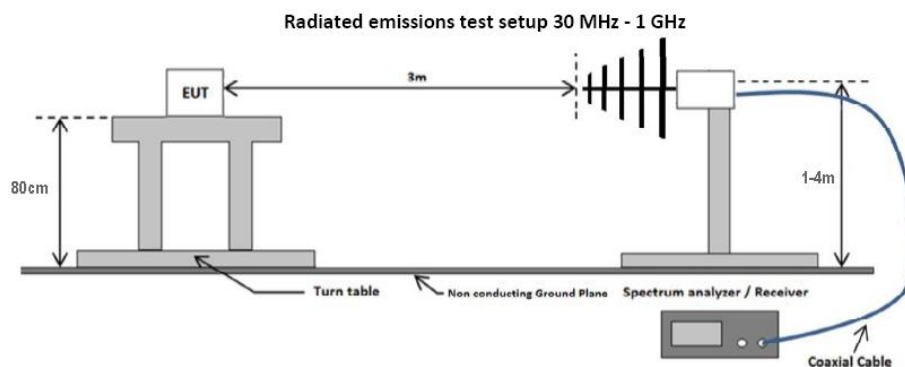
Frequency range (MHz)	Field Strength (μV/m)
0.009~0.490	2400/F(KHz)
0.490~1.705	24000/F(KHz)
1.705~30.0	30
30 – 88	100
88 – 216	150
216 - 960	200
Above 960	500

8.1.2 Requirement in FCC Part 18

Per § 18.305 (b), the field strength levels of emissions which lie outside the bands specified in § 18.301, unless otherwise indicated, shall not exceed the following

Equipment	Operating frequency	RF Power generated by equipment (watts)	Field strength limit (uV/m)	Distance (m)
Any type unless otherwise specified (miscellaneous)	Any ISM frequency	Below 500	25	300
	Any non-ISM frequency	Below 500	15	300

8.1.3 Test setup



8.1.4 **Test procedure**

According to section 12.2.7 Radiated spurious emission measurements in KDB 558074 D01 DTS Meas Guidance v04 and the procedures for maximizing and measuring radiated emissions that are described in ANSI C63.10 was followed. Boresight antenna mast was used for above 1GHz during the scanning to point to EUT to maximize the emission. The procedure in FCC/OET MP-5 is also followed when the emission below 1GHz is measured to against the Part 18 field strength limit.

1. The EUT was switched on and allowed to warm up to its normal operating condition.
2. The test was carried out at the selected frequency points obtained from the EUT characterization. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner:
 - a. Vertical or horizontal polarization (whichever gave the higher emission level over a full rotation of the EUT) was chosen.
 - b. The EUT was then rotated to the direction that gave the maximum emission.
 - c. Finally, the antenna height was adjusted to the height that gave the maximum emission.
3. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-Peak detection at frequency below 1GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz with Peak detection for Peak measurement at frequency above 1GHz.

The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz with Peak detection for Average Measurement as below at frequency above 1GHz.
5. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.

8.1.5 Test result

Initial scan to determine the worst case orientation

The following three different EUT orientation has been evaluated and the downward orientation is found to be the worst case.

- 1) Upward
- 2) Downward
- 3) Sideward

Downward orientation at BLE mid channel

Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table deg	Limit dBuV/m	Margin dB
4884.00	43.76	6.89	-5.56	45.08	PK	H	100	46	54	-8.92
7326.00	36.14	9.43	-1.18	44.39	PK	H	400	183	54	-9.61

Sideward orientation at BLE mid channel

Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table deg	Limit dBuV/m	Margin dB
4884.00	38.78	6.89	-5.56	40.11	PK	H	100	176	54	-15.22
7326.00	35.47	9.54	-1.12	43.89	PK	V	200	227	54	-10.11

Upward orientation at BLE mid channel

Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table deg	Limit dBuV/m	Margin dB
4884.00	41.29	6.89	-5.56	42.62	PK	H	100	98	54	-12.71
7326.00	35.57	9.62	-1.13	44.06	PK	H	300	112	54	-9.94

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Follow-up scan to determine the appropriate limit

EUT is a combination of Part 18 transmitter (13.56MHz ISM band) and Part 15C DTS transmitter (2.4GHz BLE). When both transmitters are activated and co-located to each other, emissions from each transmitter need to comply with their relevant rule parts. In this case, the emissions due to the operation of the 13.56MHz transmitter must comply with the appropriate Part 18 field strength limit. When the part 18 transmitter is active, the Part 18 limits apply. That includes both the harmonics of 13.56MHz AND the general emissions from the device when the Part 18 transmitter is active.

Following measurements have been made to determine what outstanding emissions are from 13.56MHz transmitter and if 47CFR 15.209 limit is applicable.

- 1) Bluetooth transmitting at mid CH (13.56MHz transmitter is off)
- 2) 13.56MHz transmitter is on (Bluetooth is off)
- 3) Both Bluetooth and 13.56MHz transmitter are on

Conclusion: It was found that all the emissions that is above 47CFR 15.209 emission limit are harmonics of 13.56MHz transmitter or directly from it, so they shall be compared to Part18 field strength limit instead of Part15. See the following results for reference.

Note: The listed emissions in the 250MHz range are present only when the 13.56MHz transmitter is on, regardless of whether the 2.4GHz transmitter is on or off. When the 13.56MHz transmitter is turned off and only the 2.4GHz transmitter is on, these emissions are substantially lower. That way, we demonstrate that the emissions are due to the operation of the Part 18 transmitter and ought to be compared to the general emissions limit for Part 18.

Comparison results

1) Result for Bluetooth transmitting at mid CH (13.56MHz transmitter is off)

Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table deg	Limit dBuV/m	Margin dB
256.98	21.89	5.32	12.46	39.66	PK	V	100	253	46	-6.34
316.15	15.51	5.80	13.68	35.00	PK	H	100	182	46	-11.00
30.97	6.19	2.26	15.46	23.91	PK	V	400	92	40	-16.09

Note: None harmonic from 13.56MHz is found.

2) Result for 13.56MHz transmitter is on (Bluetooth is off)

Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table deg	Limit dBuV/m	Margin dB
271.045	38.19	5.44	12.58	56.21	PK	H	100	38	63.52	-7.31
40.68	35.25	2.56	10.06	47.87	PK	V	100	182	67.97	-20.10
637.22	23.99	7.22	21.69	52.89	PK	V	100	98	63.52	-10.63
935.98	21.43	7.75	23.67	52.85	PK	V	100	152	63.52	-10.67
175.985	35.8	4.51	9.64	49.96	PK	V	100	109	63.52	-13.56
840.92	21.15	7.4	23.59	52.14	PK	V	100	28	63.52	-11.38
677.96	22.31	7.28	22.29	51.88	PK	V	300	76	63.52	-11.64
868.08	20.86	7.5	23.45	51.81	PK	V	100	162	63.52	-11.71
650.8	22.51	7.24	21.89	51.65	PK	H	100	98	63.52	-11.87
908.82	20.51	7.64	23.39	51.54	PK	V	100	228	63.52	-11.98

Note: All these are harmonics from 13.56MHz and shall comply with Part 18 field strength limit. None other emission was found that is above

3) Result for both Bluetooth and 13.56MHz transmitter are on

Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table deg	Limit dBuV/m	Margin dB
610.06	29.03	7.18	21.26	57.47	PK	V	100	87	63.52	-6.05
935.98	22.32	7.75	23.67	53.74	PK	V	100	109	63.52	-9.78
637.22	23.77	7.22	21.69	52.68	PK	V	100	93	63.52	-10.84
623.64	23.76	7.20	21.48	52.44	PK	V	100	128	63.52	-11.08
271.05	34.38	5.44	12.58	52.40	PK	H	100	109	63.52	-11.12
582.90	24.68	6.99	20.70	52.38	PK	V	100	253	63.52	-11.14
40.68	33.65	2.56	10.06	46.27	PK	V	100	19	67.97	-21.70
596.48	22.99	7.13	21.02	51.14	PK	V	100	308	63.52	-12.38
908.82	20.02	7.64	23.39	51.05	PK	V	100	76	63.52	-12.47
785.63	20.11	7.25	23.64	51.00	PK	V	200	108	63.52	-12.52

Note: These emissions are those found above Part15 emission limit and they're all different orders harmonics of 13.56MHz transmitter. So they shall be compared to Part 18 limit. No other outstanding emission was found that is above Part 15 emission limit.

Final test result for 30MHz – 1000MHz

Downward orientation at BLE low channel – 2402MHz (simultaneous TX with 13.56MHz)

Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table deg	Limit dBuV/m	Margin dB
271.20	37.54	5.44	12.58	55.56	QP	H	100	56	63.52	-7.96
610.20	22.39	7.18	21.26	50.84	QP	V	178	129	63.52	-12.68
935.71	14.90	7.75	23.67	46.32	QP	H	128	99	63.52	-17.20
242.54	25.65	5.18	12.07	42.91	QP	H	100	39	63.52	-20.61
259.56	24.04	5.34	12.48	41.87	QP	H	208	50	63.52	-21.65
40.68	33.39	2.56	10.05	46.00	QP	V	100	351	67.97	-21.97
148.89	11.82	4.23	9.18	25.23	QP	V	259	80	63.52	-38.29

Note: All the above emissions are due to the operation of the Part 18 emitter.

Downward orientation at BLE mid channel – 2442MHz (simultaneous TX with 13.56MHz)

Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table deg	Limit dBuV/m	Margin dB
271.20	38.49	5.44	12.58	56.52	QP	H	100	66	63.52	-7.00
935.97	13.11	7.75	23.67	44.53	QP	V	400	113	63.52	-18.99
949.33	13.23	7.80	23.81	44.83	QP	V	293	139	63.52	-18.69
908.57	19.74	7.64	23.39	50.77	QP	V	101	136	63.52	-12.75
40.68	33.05	2.56	10.05	45.67	QP	V	100	0	67.97	-22.30
149.07	24.82	4.24	9.18	38.24	QP	V	100	318	63.52	-25.28
650.87	19.78	7.24	21.89	48.92	QP	H	100	361	67.97	-19.05
610.19	21.35	7.18	21.26	49.80	QP	V	175	319	63.52	-13.72
162.65	28.31	4.38	9.43	42.11	QP	V	100	335	63.52	-21.41
189.81	31.76	4.64	9.85	46.25	QP	V	107	360	63.52	-17.27
248.04	25.52	5.23	12.32	43.07	QP	H	150	257	63.52	-20.45
67.80	33.54	3.13	6.98	43.65	QP	V	103	346	63.52	-19.87
258.43	24.57	5.33	12.47	42.37	QP	H	128	97	63.52	-21.15

Note: All the above emissions are due to the operation of the Part 18 emitter.

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Downward orientation at BLE high channel – 2480MHz (simultaneous TX with 13.56MHz)

Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table deg	Limit dBuV/m	Margin dB
271.21	37.68	5.44	12.58	55.70	QP	H	102	78	63.52	-7.82
246.23	26.34	5.22	12.24	43.79	QP	H	150	72	63.52	-19.73
935.64	20.94	7.75	23.67	52.35	QP	V	100	106	63.52	-11.17
40.68	32.98	2.56	10.05	45.59	QP	V	100	0	67.97	-22.38

Note: All the above emissions are due to the operation of the Part 18 emitter.

Final test result for 1GHz – 18GHz

Downward orientation at BLE low channel – 2402MHz (simultaneous TX with 13.56MHz)

Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table deg	Limit dBuV/m	Margin dB
1000.52	43.64	3.55	-13.22	33.96	PK	V	104	287	74	-40.04
4804.49	42.62	6.87	-5.54	43.95	PK	V	166	146	74	-30.05
1234.07	56.95	4.02	-11.83	49.13	PK	V	118	135	74	-24.87
14931.25	21.74	15.91	5.53	43.18	PK	H	204	238	74	-30.83
1000.52	31.36	3.55	-13.22	21.69	AV	V	104	287	54	-32.31
4804.49	32.18	6.87	-5.54	33.52	AV	V	166	146	54	-20.48
1234.07	54.92	4.02	-11.83	47.10	AV	V	118	135	54	-6.90
14931.25	10.05	15.91	5.53	31.49	AV	H	204	238	54	-22.52

Downward orientation at BLE mid channel – 2442MHz (simultaneous TX with 13.56MHz)

Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table deg	Limit dBuV/m	Margin dB
1000.33	53.36	3.55	-13.23	43.68	PK	H	128	4	74	-30.32
1234.00	56.21	4.02	-11.83	48.40	PK	V	117	122	74	-25.60
7429.52	35.79	9.65	-1.14	44.30	PK	H	173	137	74	-29.70
4888.82	38.88	6.89	-5.56	40.20	PK	H	250	344	74	-33.80
17607.63	18.18	17.30	11.82	47.30	PK	H	343	43	74	-26.70
10147.46	29.94	11.47	0.83	42.24	PK	H	186	361	74	-31.76
14929.76	21.56	15.90	5.53	42.99	PK	V	310	122	74	-31.01
1000.33	31.57	3.55	-13.23	21.88	AV	H	128	4	54	-32.12
1234.00	54.03	4.02	-11.83	46.21	AV	V	117	122	54	-7.79
7429.52	23.76	9.65	-1.14	32.27	AV	H	173	137	54	-21.73
4888.82	34.16	6.89	-5.56	35.49	AV	H	250	344	54	-18.51
17607.63	6.04	17.30	11.82	35.17	AV	H	343	43	54	-18.83
10147.46	18.05	11.47	0.83	30.35	AV	H	186	361	54	-23.65
14929.76	10.04	15.90	5.53	31.47	AV	V	310	122	54	-22.53

Downward orientation at BLE high channel – 2480MHz (simultaneous TX with 13.56MHz)

Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table deg	Limit dBuV/m	Margin dB
1000.00	43.62	3.55	-13.23	33.93	PK	V	400	330	74	-40.07
1234.02	56.77	4.02	-11.83	48.96	PK	V	114	144	74	-25.04
4960.63	38.96	6.91	-5.70	40.17	PK	V	230	132	74	-33.83
1000.00	31.38	3.55	-13.23	21.69	AV	V	400	330	54	-32.31
1234.02	54.74	4.02	-11.83	46.92	AV	V	114	144	54	-7.08
4960.63	27.51	6.91	-5.70	28.72	AV	V	230	132	54	-25.28

Report Number:	BPT-18080801-FCC-SpuriousEmission Rev1.1
Product:	Bluetooth Smart Module
Model Number:	EC-0137/PAN1740



Final test result for 18GHz – 25GHz

Note: No outstanding emission was found during scan in 18GHz-25GHz.

Report Number:	BPT-18080801-FCC-SpuriousEmission Rev1.1
Product:	Bluetooth Smart Module
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9 Test instrument list

Equipment	Manufacturer	Model	Serial Number	Cal. Date	Cal. Due
Semi-Anechoic Chamber	ETS-Lindgren	10M	VL001	5/11/2018	5/11/2019
Shielding Control Room	ETS-Lindgren	Series 81	VL006	N/A	N/A
Spectrum Analyzer	Keysight	N9020A	MY50110074	5/4/2018	5/4/2019
EMC Test Receiver	R&S	ESL6	100230	5/7/2018	5/7/2019
Bi-Log Antenna	ETS-Lindgren	3142E	217921	11/15/2017	11/15/2018
Horn Antenna	AH Systems	SAS-571	433	8/14/2017	8/14/2018
Horn Antenna	Electro-Metrics	EM-6961	6292	5/2/2018	5/2/2019
Horn Antenna (18-40GHz)	Com-Power	AH-840	101109	5/2/2018	5/2/2019
Preamplifier	RF Bay, Inc.	LPA-10-20	11180621	N/A	N/A
True RMS Multi-meter	UNI-T	UT181A	C173014829	5/10/2018	5/10/2019
Temp / Humidity / Pressure Meter	PCE Instruments	PCE-THB 40	R062028	5/9/2018	5/9/2019
RF Attenuator	Pasternack	PE7005-3	VL061	N/A	N/A
Preamplifier 100KHz - 40GHz	Aeroflex	33711-392-77150-11	064	N/A	N/A
EM Center Control	ETS-Lindgren	7006-001	160136	N/A	N/A
Turn Table	ETS-Lindgren	2181-3.03	VL002	N/A	N/A
Boresight Antenna Tower	ETS-Lindgren	2171B	VL003	N/A	N/A
Loop Antenna (9k-30MHz)	Com-Power	AL-130	121012	5/9/18	5/9/19