

TEST REPORT

Product : Digital Blood Pressure Monitor
Trade mark : **microlife**
Model/Type reference : BP3GY1-2N
Test Model No. : BP3GY1-2N
Serial Number : N/A
Report Number : EED32N810192
FCC ID : U7I-BP3GY1-2N
Date of Issue : Nov. 26, 2021
Test Standards : 47 CFR Part 15 Subpart C
Test result : PASS

Prepared for:

Microlife Corporation
9F, 431, RuiGuang Road, NeiHu Taipei 11492, Taiwan

Prepared by:

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Date:

Nov. 26, 2021

Check No.: 1736141021



1 Version

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00	Nov. 26, 2021	Original

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3 Version

Version No.	Date	Description
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4 Test Summary

Test Item	Test Requirement	Result
Antenna Requirement	47 CFR Part 15 Subpart C Section 15.203/15.247 (c)	PASS
AC Power Line Conducted Emission	47 CFR Part 15 Subpart C Section 15.207	Note
DTS Bandwidth	47 CFR Part 15 Subpart C Section 15.247 (a)(2)	Note
Maximum Conducted Output Power	47 CFR Part 15 Subpart C Section 15.247 (b)(3)	Note
Maximum Power Spectral Density	47 CFR Part 15 Subpart C Section 15.247 (e)	Note
Band Edge Measurements	47 CFR Part 15 Subpart C Section 15.247(d)	Note
Conducted Spurious Emissions	47 CFR Part 15 Subpart C Section 15.247(d)	Note
Restricted bands	47 CFR Part 15 Subpart C Section 15.205/15.209	Note
Radiated Spurious Emission	47 CFR Part 15 Subpart C Section 15.205/15.209	PASS

Note: Refer to the report of EED32K00328901,

This test report (Ref. No.: EED32N810192) is only valid with the original test report (Ref. No.: EED32K00328901).

Review this report and original report, the EUT just update antenna there are no changes in circuit and product function, so this report just update antenna and photos.

Therefore in this report the Radiated Spurious Emission were retested and shown the data in this report, other tests data please refer to original report No. EED32K00328901.

Remark:

Company Name and Address shown on Report, the sample(s) and sample Information were provided by the applicant who should be responsible for the authenticity which CTI hasn't verified.

5 General Information

5.1 Client Information

Applicant:	Microlife Corporation
Address of Applicant:	9F, 431, RuiGuang Road, NeiHu Taipei 11492, Taiwan
Manufacturer:	ONBO Electronic (Shenzhen) Co., Ltd.
Address of Manufacturer:	No.138, Huasheng Road, Langkou Community, Dalang Street, Longhua District, Shenzhen, China
Factory:	ONBO Electronic (Shenzhen) Co., Ltd.
Address of Factory:	No.138, Huasheng Road, Langkou Community, Dalang Street, Longhua District, Shenzhen, China

5.2 General Description of EUT

Product Name:	Digital Blood Pressure Monitor		
Mode No.:	BP3GY1-2N		
Test Mode No.:	BP3GY1-2N		
Trade mark:			
EUT Supports Radios application:	Bluetooth single mode: 2402-2480MHz		
Bluetooth Version:	V4.2		
Product Type:	☐ Mobile ☒ Portable ☐ Fix Location		
Power Supply:	Adapter:	Model: DSA-6E-05 US 060060, Input: 100-240V~50/60Hz 0.3A Output: +6V, 0.6A	
	Battery:	4*AAA	
Test Voltage:	DC 6V		
Sample Received Date:	Aug. 05, 2021		
Sample tested Date:	Aug. 05, 2021 to Aug. 24, 2021		

5.3 Product Specification subjective to this standard

Operation Frequency:	2402MHz~2480MHz
Modulation Type:	GFSK
Transfer Rate:	☒ 1Mbps ☐ 2Mbps
Number of Channel:	40
Antenna Type:	Chip antenna
Antenna Gain:	3dBi

Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
0	2402MHz	10	2422MHz	20	2442MHz	30	2462MHz
1	2404MHz	11	2424MHz	21	2444MHz	31	2464MHz
2	2406MHz	12	2426MHz	22	2446MHz	32	2466MHz
3	2408MHz	13	2428MHz	23	2448MHz	33	2468MHz
4	2410MHz	14	2430MHz	24	2450MHz	34	2470MHz
5	2412MHz	15	2432MHz	25	2452MHz	35	2472MHz
6	2414MHz	16	2434MHz	26	2454MHz	36	2474MHz
7	2416MHz	17	2436MHz	27	2456MHz	37	2476MHz
8	2418MHz	18	2438MHz	28	2458MHz	38	2478MHz
9	2420MHz	19	2440MHz	29	2460MHz	39	2480MHz

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Channel	Frequency
The lowest channel (CH0)	2402MHz
The middle channel (CH19)	2440MHz
The highest channel (CH39)	2480MHz

5.4 Test Configuration

EUT Test Software Settings:				
Software:		nRFgo Studio		
EUT Power Grade:		Default		
Use test software to set the lowest frequency, the middle frequency and the highest frequency keep transmitting of the EUT.				
Test Mode	Modulation	Rate	Channel	Frequency(MHz)
Mode a	GFSK	1Mbps	CH0	2402
Mode b	GFSK	1Mbps	CH19	2440
Mode c	GFSK	1Mbps	CH39	2480

5.5 Test Environment

Operating Environment:	
Radiated Spurious Emissions:	
Temperature:	22~25.0 °C
Humidity:	50~55 % RH
Atmospheric Pressure:	1010mbar

5.6 Description of Support Units

The EUT has been tested with associated equipment below.

Associated equipment name		Manufacture	model	S/N serial number	Supplied by	Certification
AE	Notebook	DELL	DELL 3490	D245DX2	CTI	CE&FCC

5.7 Test Location

All tests were performed at:

Centre Testing International Group Co., Ltd

Building C, Hongwei Industrial Park Block 70, Bao'an District, Shenzhen, China

Telephone: +86 (0) 755 33683668 Fax: +86 (0) 755 33683385

No tests were sub-contracted.

FCC Designation No.: CN1164

5.8 Measurement Uncertainty (95% confidence levels, k=2)

No.	Item	Measurement Uncertainty
1	Radio Frequency	7.9×10^{-8}
2	RF power, conducted	0.46dB (30MHz-1GHz)
		0.55dB (1GHz-18GHz)
3	Radiated Spurious emission test	3.3dB (9kHz-30MHz)
		4.3dB (30MHz-1GHz)
		4.5dB (1GHz-18GHz)
		3.4dB (18GHz-40GHz)
4	Conduction emission	3.5dB (9kHz to 150kHz)
		3.1dB (150kHz to 30MHz)
5	Temperature test	0.64°C
6	Humidity test	3.8%
7	DC power voltages	0.026%

6 Equipment List

3M Semi/full-anechoic Chamber					
Equipment	Manufacturer	Model No.	Serial Number	Cal. date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
3M Chamber & Accessory Equipment	TDK	SAC-3	---	05-24-2019	05-23-2022
TRILOG Broadband Antenna	Schwarzbeck	VULB9163	9163-618	05-16-2021	05-15-2022
Loop Antenna	Schwarzbeck	FMZB 1519B	1519B-076	04-15-2021	04-14-2024
Receiver	R&S	ESC17	100938-003	10-14-2021	10-13-2022
Temperature/ Humidity Indicator	Shanghai qixiang	HM10	1804298	06-24-2021	06-23-2022
Cable line	Fulai(7M)	SF106	5219/6A	---	---
Cable line	Fulai(6M)	SF106	5220/6A	---	---
Cable line	Fulai(3M)	SF106	5216/6A	---	---
Cable line	Fulai(3M)	SF106	5217/6A	---	---
Cable line	Fulai(3M)	SF106	5217/6A	---	---

3M full-anechoic Chamber					
Equipment	Manufacturer	Model No.	Serial Number	Cal. date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
RSE Automatic test software	JS Tonscend	JS36-RSE	10166	---	---
Receiver	Keysight	N9038A	MY57290136	03-04-2021	03-03-2022
Spectrum Analyzer	Keysight	N9020B	MY57111112	03-04-2021	03-03-2022
Spectrum Analyzer	Keysight	N9030B	MY57140871	03-04-2021	03-03-2022
TRILOG Broadband Antenna	Schwarzbeck	VULB 9163	9163-1148	04-28-2021	04-27-2024
Horn Antenna	Schwarzbeck	BBHA 9170	9170-832	04-15-2021	04-14-2024
Horn Antenna	ETS-LINDGREN	3117	57407	07-04-2021	07-03-2024
Preamplifier	EMCI	EMC184055SE	980597	05-20-2021	05-19-2022
Preamplifier	EMCI	EMC001330	980563	04-15-2021	04-14-2022
Preamplifier	JS Tonscend	980380	EMC051845 SE	12-31-2020	12-30-2021
Communication test set	R&S	CMW500	102898	12-31-2020	12-30-2021
Temperature/Humidity Indicator	biaozhi	GM1360	EE1186631	04-16-2021	04-15-2022
Fully Anechoic Chamber	TDK	FAC-3	---	01-09-2021	01-08-2024
Cable line	Times	SFT205-NMSM-2.50M	394812-0001	---	---
Cable line	Times	SFT205-NMSM-2.50M	394812-0002	---	---
Cable line	Times	SFT205-NMSM-2.50M	394812-0003	---	---
Cable line	Times	SFT205-NMSM-2.50M	393495-0001	---	---
Cable line	Times	EMC104-NMNM-1000	SN160710	---	---
Cable line	Times	SFT205-NMSM-3.00M	394813-0001	---	---
Cable line	Times	SFT205-NMNM-1.50M	381964-0001	---	---
Cable line	Times	SFT205-NMSM-7.00M	394815-0001	---	---
Cable line	Times	HF160-KMKM-3.00M	393493-0001	---	---

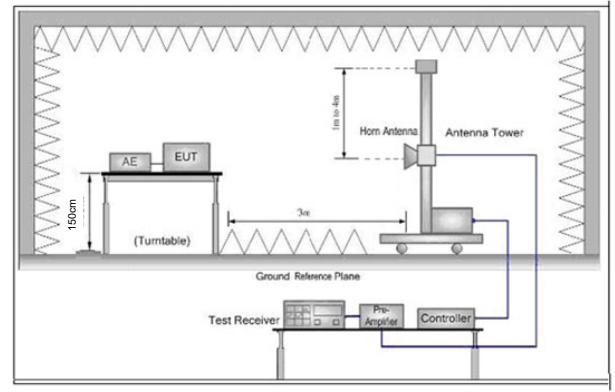
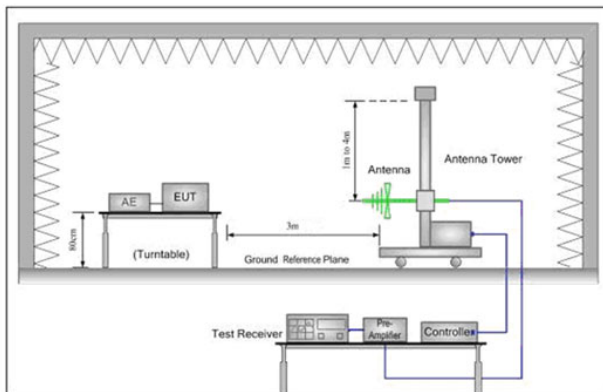
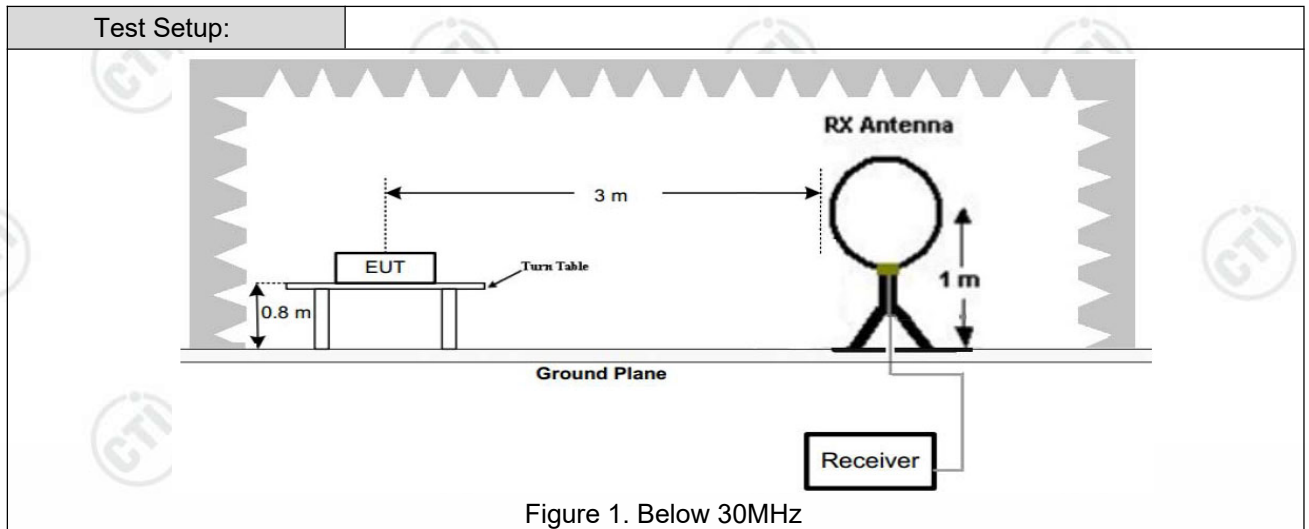
7 Test results and Measurement Data

7.1 Antenna Requirement

Standard requirement:	47 CFR Part 15C Section 15.203 /247(c)
15.203 requirement: 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, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. 15.247(b) (4) requirement: The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.	
EUT Antenna:	Please see Internal photos
The antenna is Chip antenna. The best case gain of the antenna is 3dBi.	

7.2 Radiated Spurious Emission

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205				
Test Method:	ANSI C63.10 2013				
Test Site:	Measurement Distance: 3m (Semi-Anechoic Chamber)				
Receiver Setup:	Frequency	Detector	RBW	VBW	Remark
	0.009MHz-0.090MHz	Peak	10kHz	30kHz	Peak
	0.009MHz-0.090MHz	Average	10kHz	30kHz	Average
	0.090MHz-0.110MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	0.110MHz-0.490MHz	Peak	10kHz	30kHz	Peak
	0.110MHz-0.490MHz	Average	10kHz	30kHz	Average
	0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	30MHz-1GHz	Quasi-peak	100 kHz	300kHz	Quasi-peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
		Peak	1MHz	10kHz	Average
Limit:	Frequency	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
	0.009MHz-0.490MHz	2400/F(kHz)	-	-	300
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
	1.705MHz-30MHz	30	-	-	30
	30MHz-88MHz	100	40.0	Quasi-peak	3
	88MHz-216MHz	150	43.5	Quasi-peak	3
	216MHz-960MHz	200	46.0	Quasi-peak	3
	960MHz-1GHz	500	54.0	Quasi-peak	3
	Above 1GHz	500	54.0	Average	3
	Note: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.				



Test Procedure:

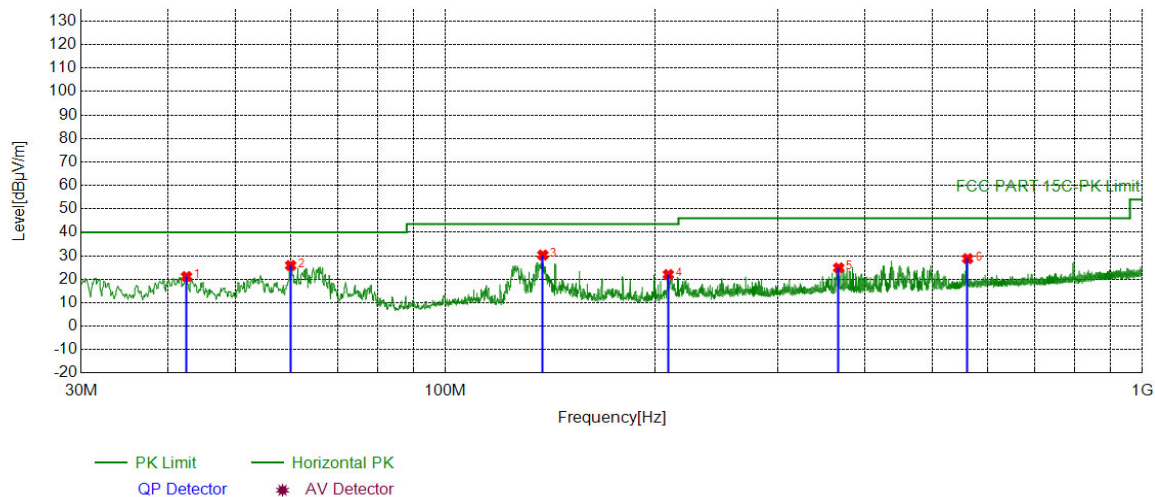
- 1) Below 1G: The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
 - 2) Above 1G: The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- Note: For the radiated emission test above 1GHz:
- Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
 - The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the

	measurement. d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. g. Test the EUT in the lowest channel (2402MHz),the middle channel (2440MHz),the Highest channel (2480MHz) h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case. i. Repeat above procedures until all frequencies measured was complete.
Test Mode:	Refer to clause 5.3
Test Results:	Pass

Radiated Spurious Emission below 1GHz:

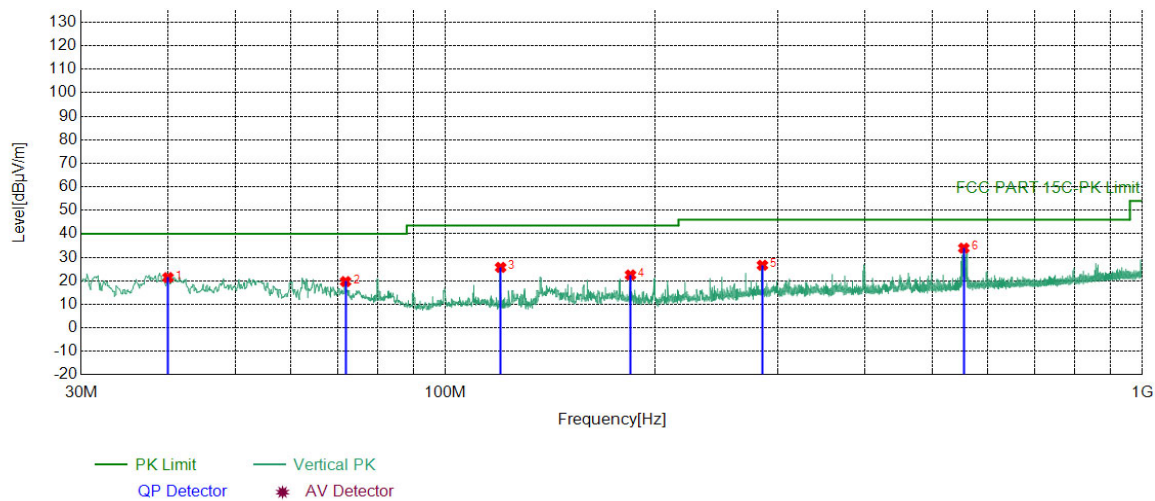
During the test, the Radiates Emission from 30MHz to 1GHz was performed in all modes, only the worst case mode a was recorded in the report.

Test Graph



NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	42.5143	-17.59	38.75	21.16	40.00	18.84	PASS	Horizontal	Peak
2	59.9760	-18.49	44.38	25.89	40.00	14.11	PASS	Horizontal	Peak
3	137.9718	-21.94	52.27	30.33	43.50	13.17	PASS	Horizontal	Peak
4	208.8859	-17.63	39.65	22.02	43.50	21.48	PASS	Horizontal	Peak
5	366.7207	-13.63	38.47	24.84	46.00	21.16	PASS	Horizontal	Peak
6	561.6132	-9.51	38.31	28.80	46.00	17.20	PASS	Horizontal	Peak

Test Graph



NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	39.9920	-18.03	39.42	21.39	40.00	18.61	PASS	Vertical	Peak
2	71.9082	-21.14	40.83	19.69	40.00	20.31	PASS	Vertical	Peak
3	120.0250	-20.08	45.79	25.71	43.50	17.79	PASS	Vertical	Peak
4	184.3424	-19.36	41.85	22.49	43.50	21.01	PASS	Vertical	Peak
5	285.0385	-15.83	42.45	26.62	46.00	19.38	PASS	Vertical	Peak
6	554.6285	-9.70	43.59	33.89	46.00	12.11	PASS	Vertical	Peak

Radiated Spurious Emission above 1GHz:

Mode:			BLE GFSK Transmitting			Channel:		2402 MHz	
NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1165.4165	0.82	42.67	43.49	74.00	30.51	Pass	H	PK
2	1791.8792	3.25	42.85	46.10	74.00	27.90	Pass	H	PK
3	3603.0402	-20.36	65.93	45.57	74.00	28.43	Pass	H	PK
4	4803.1202	-16.23	63.14	46.91	74.00	27.09	Pass	H	PK
5	7205.2804	-11.83	57.30	45.47	74.00	28.53	Pass	H	PK
6	12015.6010	-5.35	53.13	47.78	74.00	26.22	Pass	H	PK
7	1198.4198	0.80	43.99	44.79	74.00	29.21	Pass	V	PK
8	1868.4868	3.79	41.64	45.43	74.00	28.57	Pass	V	PK
9	3603.0402	-20.36	64.17	43.81	74.00	30.19	Pass	V	PK
10	4804.1203	-16.23	63.98	47.75	74.00	26.25	Pass	V	PK
11	7206.2804	-11.83	58.88	47.05	74.00	26.95	Pass	V	PK
12	11253.5502	-6.54	53.85	47.31	74.00	26.69	Pass	V	PK

Mode:			BLE GFSK Transmitting			Channel:		2440 MHz	
NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1210.2210	0.83	42.91	43.74	74.00	30.26	Pass	H	PK
2	1812.8813	3.38	42.18	45.56	74.00	28.44	Pass	H	PK
3	4212.0808	-17.92	56.81	38.89	74.00	35.11	Pass	H	PK
4	6118.2079	-13.16	54.10	40.94	74.00	33.06	Pass	H	PK
5	8907.3938	-9.16	52.32	43.16	74.00	30.84	Pass	H	PK
6	12570.6380	-4.32	51.79	47.47	74.00	26.53	Pass	H	PK
7	1385.0385	1.34	42.70	44.04	74.00	29.96	Pass	V	PK
8	1992.4993	4.51	43.83	48.34	74.00	25.66	Pass	V	PK
9	4195.0797	-18.03	61.14	43.11	74.00	30.89	Pass	V	PK
10	6988.2659	-11.82	53.98	42.16	74.00	31.84	Pass	V	PK
11	8791.3861	-9.52	53.59	44.07	74.00	29.93	Pass	V	PK
12	13303.6869	-3.44	51.12	47.68	74.00	26.32	Pass	V	PK

Mode:			BLE GFSK Transmitting			Channel:		2480 MHz	
NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1189.8190	0.81	42.69	43.50	74.00	30.50	Pass	H	PK
2	1851.0851	3.66	41.65	45.31	74.00	28.69	Pass	H	PK
3	3720.0480	-19.78	64.24	44.46	74.00	29.54	Pass	H	PK
4	4959.1306	-15.98	62.00	46.02	74.00	27.98	Pass	H	PK
5	7439.2960	-11.34	57.57	46.23	74.00	27.77	Pass	H	PK
6	12268.6179	-5.53	53.51	47.98	74.00	26.02	Pass	H	PK
7	1278.2278	1.00	42.77	43.77	74.00	30.23	Pass	V	PK
8	1794.0794	3.26	43.25	46.51	74.00	27.49	Pass	V	PK
9	3720.0480	-19.78	62.38	42.60	74.00	31.40	Pass	V	PK
10	5760.1840	-13.71	57.77	44.06	74.00	29.94	Pass	V	PK
11	7439.2960	-11.34	56.06	44.72	74.00	29.28	Pass	V	PK
12	12563.6376	-4.37	52.08	47.71	74.00	26.29	Pass	V	PK

Remark:

- 1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:
 Final Test Level = Receiver Reading + Factor
 Factor = Antenna Factor + Cable Factor – Preamplifier Factor
- 2) Scan from 9kHz to 25GHz, the disturbance above 18GHz and below 30MHz was very low. As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. So, only the peak measurements were shown in the report.