

Produkte  
Products

**Prüfbericht - Nr.:** 14048644 001

Test Report No.:

Seite 1 von 20

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**Auftraggeber:** Shenzhen Fushike Electronic Technology CO., LTD  
**Client:** 2F, Building A1, Yuguan Industrial park, Bulong Road, Longhua New District, Shenzhen, China

**Gegenstand der Prüfung:** Bluetooth Headset  
**Test Item:**

**Bezeichnung:** K10, K10S  
**Identification:**

**Serien-Nr.:**  
**Serial No.:**

Engineering sample

**Wareneingangs-Nr.:** A000515675-001  
**Receipt No.:**

**Eingangsdatum:** 18.03.2017  
**Date of Receipt:**

**Prüfort:** TÜV Rheinland Hong Kong Ltd.  
**Testing Location:** 3/F., Fou Wah Industrial Building, 10-16 Pun Shan Street, Tsuen Wan, N.T., Hong Kong  
**Global United Technology Services Co., Ltd.**  
 2nd Floor, Block No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, China

**Zustand des Prüfgegenstandes bei Anlieferung:** Test sample is not damaged and suitable for testing.  
**Condition of test item at delivery:**

**Prüfgrundlage:** FCC Part 15 Subpart C  
**Test Specification:** ANSI C63.10-2013

**Prüfergebnis:** Das vorstehend beschriebene Gerät wurde geprüft und entspricht oben genannter Prüfgrundlage.  
**Test Results:** The above mentioned product was tested and **passed**.

**Prüflaboratorium:** TÜV Rheinland Hong Kong Ltd.  
**Testing Laboratory:** 3-4, 11/F., Fou Wah Industrial Building, 10-16 Pun Shan Street, Tsuen Wan, N.T., Hong Kong

geprüft/ tested by:

07.04.2017

Joey Leung  
Project Manager



07.04.2017

Benny Lau  
Senior Project Manager



Datum  
Date

Name/Stellung  
Name/Position

Unterschrift  
Signature

Datum  
Date

Name/Stellung  
Name/Position

Unterschrift  
Signature

kontrolliert/ reviewed by:

**Sonstiges:**  
Other Aspects

FCC ID: 2AHRO-K10K10S

**Abkürzungen:** P(pass) = entspricht Prüfgrundlage  
 F(fail) = entspricht nicht Prüfgrundlage  
 N/A = nicht anwendbar  
 N/T = nicht getestet

**Abbreviations:** P(pass) = passed  
 F(fail) = failed  
 N/A = not applicable  
 N/T = not tested

Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.

This test report relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any safety mark on this or similar products.

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## Product information

### Manufacturers declarations

	Transceiver
Operating frequency range	2402 - 2480 MHz
Type of modulation	GFSK; Pi/4 DQPSK; 8 DPSK
Number of channels	79
Channel separation	1 MHz
Type of antenna	PCB Antenna
Antenna gain (dBi)	3 dBi
Power level	fix
Type of equipment	stand alone radio device
Connection to public utility power line	Yes
Nominal voltage	3.7VDC
Independent Operation Modes	Transmitting

### Product function and intended use

The equipment under test (EUT) is a Bluetooth headset. It is powered by 3.7V Li-Ion rechargeable battery. The EUT has a multi-function button for power ON/OFF, receiving and end calls, etc. In addition, the EUT has a micro-USB connector for charging purpose only.

### FCC ID: 2AHRO-K10K10S

Models	Product description
K10, K10S	Bluetooth Headset

### Submitted documents

Circuit Diagram  
 Block Diagram  
 Technical Description  
 User manual  
 Label

### Independent Operation Modes

The basic operation modes are:

- Transmitting mode.
- Normal operation mode
- Charging mode

For further information refer to User Manual

## Related Submittal(s) Grants

This device is a composite device.

This is a single application for certification of the transmitter.

The Bluetooth low energy portion is authorized under the certification procedure (refer to test report 14048742 001 issued by TÜV Rheinland HK Ltd).

## Remark

The test results in this test report are only relevant to the tested sample and does not involve any assessment in the production.

## Test Set-up and Operation Mode

### Principle of Configuration Selection

**Emission:** The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

## Test Operation and Test Software

Test operation should refer to test methodology.

- During test, Channel & Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power was selected according to the instruction given by the manufacturer. The setting of the RF output power expected by the customer shall be fixed on the firmware of the final end product.

## Special Accessories and Auxiliary Equipment

The product has been tested together with the following additional accessories:

- AC/DC Adaptor  
Model: ADP-60AD T V85  
Input: 100-240VAC, 50-60Hz, 1.5A  
Output: 16.5VDC, 3.65A
- MacBookPro  
Model: A1278  
S/N: C1MN99ERDTY3

## Countermeasures to achieve EMC Compliance

- None

## Test Methodology

### Radiated Emission

The radiated emission measurements of the transmitter part were performed according to the procedures in ANSI C63.10-2013.

For measurement below 1GHz - the equipment under test (EUT) was placed at the middle of the 80 cm height turntable. For measurement above 1GHz - the EUT was placed at the middle of the 1.5 m height turntable and RF absorbing material was placed on ground plane between turntable and measuring antenna. During the testing, the EUT was operated standalone and arranged for maximum emissions. The EUT was tested in three orthogonal planes.

The investigation is performed with the EUT rotated 360 °, the antenna height scanned between 1m and 4m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations. Repeat the measurement steps until the maximum emissions were obtained.

All radiated tests were performed at an antenna to EUT with 3 meters distance, unless stated otherwise in particular parts of this test report.

### Field Strength Calculation

The field strength at 3 m was established by adding the meter reading of the spectrum analyzer to the factors associated with antenna correction factor, cable loss, preamplifiers and filter attenuation.

The equation is expressed as follow:

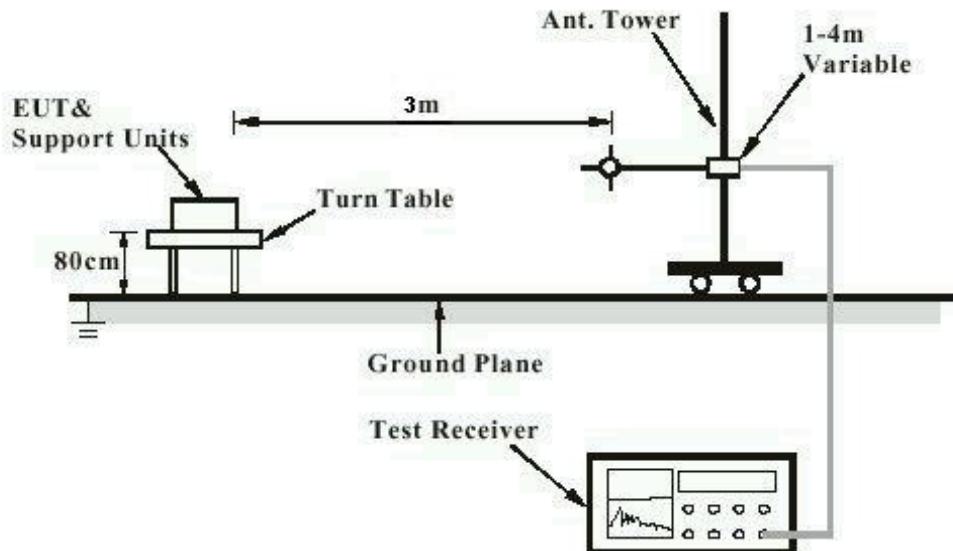
$$FS = R + AF + CF + FA - PA$$

Where FS = Field Strength in dBuV/m at 3 meters.  
R = Reading of Spectrum Analyzer in dBuV.  
AF = Antenna Factor in dB.  
CF = Cable Attenuation Factor in dB.  
FA = Filter Attenuation Factor in dB.  
PA = Preamplifier Factor in dB.

FA and PA are only be used for the measuring frequency above 1 GHz.

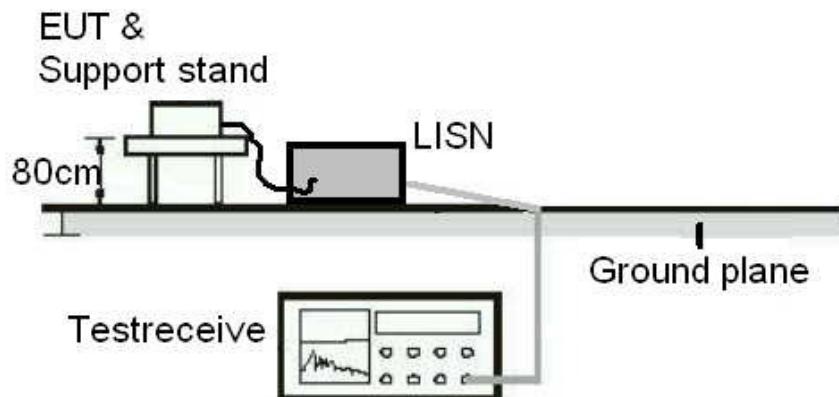
## Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test

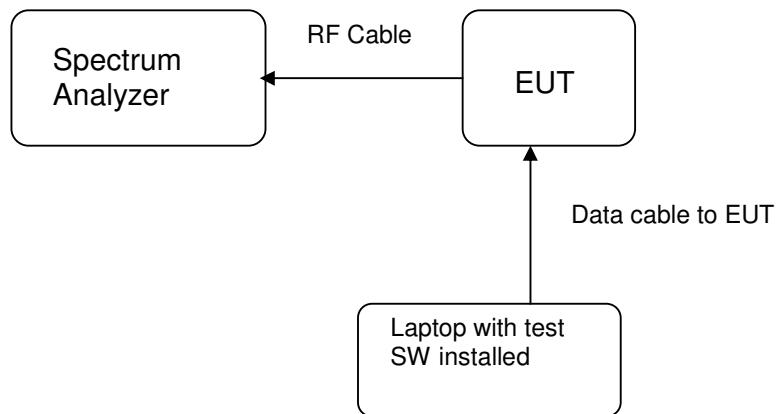


Note: Measurements above 1 GHz are done with a table height of 1.5m. In addition, there is RF absorbing material on the floor of the test site for above 1GHz measurement.

Diagram of Measurement Equipment Configuration for Mains Conduction Measurement (if applicable)



**Diagram of Equipment Configuration for Antenna-port Conducted Measurement (if applicable)**



## List of Test and Measurement Instruments

Global United Technology Services Co., Ltd. (FCC Registration number: 600491)

### Radiated Emission

Equipment	Manufacturer	Type	Cal. Date	Due Date
3m Semi- Anechoic Chamber	ZhongYu Electron	9.0(L)*6.0(W)*6.0(H)	03 Jul 2015	02 Jul 2020
Control Room	ZhongYu Electron	6.2(L)*2.5(W)*2.4(H)	N/A	N/A
ESU EMI Test Receiver	R&S	ESU26	29 Jun 2016	28 Jun 2017
Loop Antenna	Zhinan	ZN30900A	29 Jun 2016	28 Jun 2017
BiConiLog Antenna	SCHWARZBECK	VULB9163	29 Jun 2016	28 Jun 2017
Double-ridged horn antenna	SCHWARZBECK	9120D	29 Jun 2016	28 Jun 2017
Horn Antenna	ETS-LINDGREN	3160-09	29 Jun 2016	28 Jun 2017
RF Amplifier	HP	8347A	29 Jun 2016	28 Jun 2017
RF Amplifier	HP	8349B	29 Jun 2016	28 Jun 2017
Broadband Preamplifier	SCHWARZBECK	BBV9718	29 Jun 2016	28 Jun 2017
EMI Test Software	AUDIX	E3	N/A	N/A
Coaxial cable	GTS	N/A	N/A	N/A
Coaxial Cable	GTS	N/A	N/A	N/A
Thermo meter	N/A	N/A	29 Jun 2016	28 Jun 2017

### AC Mains Conducted Emission

Equipment	Manufacturer	Type	Cal. Date	Due Date
Shielding Room	ZhongYu Electron	7.3(L)*3.1(W)*2.9(H)	16 May 2014	15 May 2019
EMI Test Receiver	R&S	ESCI 7	29 Jun 2016	28 Jun 2017
Pulse Limiter	R&S	ESH3-Z2	29 Jun 2016	28 Jun 2017
Coaxial Switch	ANRITSU CORP	MP59B	29 Jun 2016	28 Jun 2017
Artificial Mains Network	SCHWARZBECK MESS	NSLK8127	29 Jun 2016	28 Jun 2017
Coaxial Cable	GTS	N/A	N/A	N/A
EMI Test Software	AUDIX	E3	N/A	N/A
Thermo meter	KTJ	TA328	29 Jun 2016	28 Jun 2017

## TÜV Rheinland Hong Kong Ltd

### Radio Test

Equipment	Manufacturer	Type	Cal. Date	Due Date
Spectrum Analyzer	R&S	FSV40	22 Jan 2017	22 Jan 2018

## Measurement Uncertainty

The estimated combined standard uncertainty for power-line conducted emissions measurements is  $\pm 2.96$  dB.

The estimated combined standard uncertainty for radiated emissions measurements is shown in below table.

Frequency Range	Uncertainty
9kHz – 30MHz	$\pm 3.70$ dB
30MHz – 1GHz	$\pm 4.64$ dB
1GHz – 18GHz	$\pm 4.83$ dB
18GHz – 25GHz	$\pm 5.20$ dB

The estimated combined standard uncertainty for antenna conducted emission is  $\pm 2.1$  dB

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor of  $k=2$ , which for the level of confidence is approximately 95%.

## Results FCC Part 15 – Subpart C

<b>FCC 15.203 – Antenna Requirement 1</b>		<b>Pass</b>				
<b>FCC Requirement:</b> No antenna other than that furnished by the responsible party shall be used with the device						
<b>Results:</b>	a) Antenna type: b) Manufacturer and model no: c) Peak Gain:	Integral PCB antenna N/A 3 dBi				
<b>Verdict:</b>	Pass					
<b>FCC 15.204 – Antenna Requirement 2</b>		<b>N/A</b>				
<b>FCC Requirement:</b> An intentional radiator may be operated only with the antenna with which it is authorized. If an antenna is marketed with the intentional radiator, it shall be of a type which is authorized with the intentional radiator.						
<b>Results:</b>	Only one integral antenna can be used.					
<b>Verdict:</b>	N/A					
<b>FCC 15.207 – Conducted Emission on AC Mains</b>		<b>Pass</b>				
Test Specification : ANSI C63.10 – 2013 Mode of operation : TX mode Port of testing : AC Mains input port of power supply Detector : Quasi-peak and Average RBW : 9 kHz Supply voltage : 120VAC 60Hz Temperature : 23°C Humidity : 50%						
<b>Requirement:</b>	15.207(a)					
<b>Results:</b>	Pass					
<b>Live measurement</b>						
Frequency range (MHz)	Frequency (MHz)	Quasi-peak dB $\mu$ V	Average dB $\mu$ V	Limit QP (dB $\mu$ V)	Limit AV (dB $\mu$ V)	Verdict
0.15 – 0.5	0.150	51.7	39.3	66.0	56.0	Pass
	0.202	44.9	34.5	63.5	53.5	Pass
> 0.5 - 5	0.535	38.8	25.3	56.0	46.0	Pass
> 5 - 30	No peak found	---	---	60.0	50.0	Pass

Neutral measurement						
Frequency range (MHz)	Frequency (MHz)	Quasi-peak dB $\mu$ V	Average dB $\mu$ V	Limit QP (dB $\mu$ V)	Limit AV (dB $\mu$ V)	Verdict
0.15 – 0.5	0.184	50.1	39.6	64.3	54.3	Pass
	0.317	38.4	27.9	59.8	49.8	Pass
> 0.5 - 5	0.634	39.9	27.3	56.0	46.0	Pass
> 5 - 30	No peak found	---	---	60.0	50.0	Pass

**Results:** Pre-scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and data rate.

The radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150kHz to 30MHz does not exceed the limits. For test Results plots refer to Appendix 1

FCC 15.247 (b)(1) – Peak Output Power		Pass		
Test Specification	:	ANSI C63.10 – 2013		
Mode of operation	:	Tx mode		
Port of testing	:	Temporary antenna port		
Supply voltage	:	3.7V internal battery		
Temperature	:	23°C		
Humidity	:	50%		
<b>FCC Requirement</b> :				
For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 Watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 Watts.				
<b>Results:</b>	For test protocols please refer to Appendix 1.			
Modulation	Frequency (MHz)	Maximum peak output power (dBm)	Limit (W/dBm)	Verdict
GFSK	2402	8.38	0.125 / 21.0	Pass
GFSK	2441	9.73	0.125 / 21.0	Pass
GFSK	2480	9.64	0.125 / 21.0	Pass
8DPSK	2402	6.22	0.125 / 21.0	Pass
8DPSK	2441	8.20	0.125 / 21.0	Pass
8DPSK	2480	8.12	0.125 / 21.0	Pass

<b>FCC 15.247 (a) – 20 dB Bandwidth</b>		<b>Pass</b>																																			
<b>FCC Requirement:</b> N/A																																					
Test Specification : ANSI C63.10 – 2013 Mode of operation : Tx mode Port of testing : Temporary antenna port Supply voltage : 3.7V internal battery Temperature : 23°C Humidity : 50%																																					
<b>Results:</b> Pre-scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and packet types.  For test protocols refer to Appendix 1.																																					
<table border="1"> <thead> <tr> <th>Modulation</th><th>Frequency (MHz)</th><th>20 dB left (MHz)</th><th>20 dB right (MHz)</th><th>20dB bandwidth (MHz)</th></tr> </thead> <tbody> <tr> <td>GFSK</td><td>2402</td><td>2401.488</td><td>2402.443</td><td>0.955</td></tr> <tr> <td>GFSK</td><td>2441</td><td>2440.488</td><td>2441.439</td><td>0.951</td></tr> <tr> <td>GFSK</td><td>2480</td><td>2479.483</td><td>2480.439</td><td>0.955</td></tr> <tr> <td>8DPSK</td><td>2402</td><td>2401.313</td><td>2402.608</td><td>1.295</td></tr> <tr> <td>8DPSK</td><td>2441</td><td>2440.313</td><td>2441.601</td><td>1.288</td></tr> <tr> <td>8DPSK</td><td>2480</td><td>2479.305</td><td>2480.593</td><td>1.288</td></tr> </tbody> </table>		Modulation	Frequency (MHz)	20 dB left (MHz)	20 dB right (MHz)	20dB bandwidth (MHz)	GFSK	2402	2401.488	2402.443	0.955	GFSK	2441	2440.488	2441.439	0.951	GFSK	2480	2479.483	2480.439	0.955	8DPSK	2402	2401.313	2402.608	1.295	8DPSK	2441	2440.313	2441.601	1.288	8DPSK	2480	2479.305	2480.593	1.288	
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8DPSK	2480	2479.305	2480.593	1.288																																	

<b>FCC 15.247(a)(1) – Carrier Frequency Separation</b>		<b>Pass</b>						
<b>FCC Requirement:</b>								
Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25kHz or the $2/3 \times 20$ dB bandwidth of the hopping channel, whichever is greater.								
Test Specification : ANSI C63.10 – 2013 Mode of operation : Tx mode (hopping on) Port of testing : Temporary antenna port Supply voltage : 3.7V internal battery Temperature : 23°C Humidity : 50%								
<b>Results:</b> Pre-scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and packet types.  For test Results plots refer to Appendix 1.								
<table border="1"> <thead> <tr> <th>Channel Separation (kHz)</th><th>Limit (kHz)</th><th>Verdict</th></tr> </thead> <tbody> <tr> <td>998.6</td><td><math>\geq 863</math></td><td>Pass</td></tr> </tbody> </table>		Channel Separation (kHz)	Limit (kHz)	Verdict	998.6	$\geq 863$	Pass	
Channel Separation (kHz)	Limit (kHz)	Verdict						
998.6	$\geq 863$	Pass						

<b>FCC 15.247 (a)(1)(iii) – Number of hopping channels</b>		<b>Pass</b>
<b>FCC Requirement:</b>		
Frequency hopping systems operating in the 2400MHz-2483.5MHz bands shall use at least 15 hopping frequencies.		
Test Specification : ANSI C63.10 – 2013 Mode of operation : Tx mode (hopping on) Port of testing : Temporary antenna port Supply voltage : 3.7V internal battery Temperature : 23°C Humidity : 50%		
<b>Results:</b>	For test Results plots refer to Appendix 1.	
No. of hopping channels	Limit	Verdict
79	≥ 15	Pass

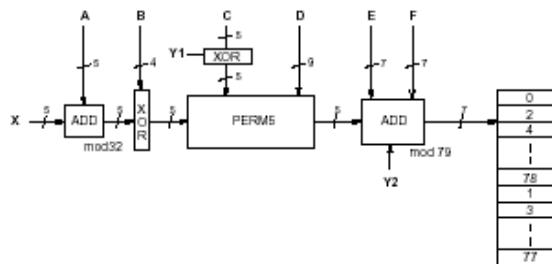
<b>FCC 15.247 (a)(1)(iii) – Time of Occupancy (Dwell Time)</b>		<b>Pass</b>
<b>FCC Requirement:</b>		
Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.		
Test Specification : ANSI C63.10 – 2013 Mode of operation : Tx mode (hopping on) Port of testing : Temporary antenna port Supply voltage : 3.7V internal battery Temperature : 23°C Humidity : 50%		
<b>Results:</b>	Time period calculation = $0.4 \times 79 = 31.6\text{s}$ Dwell time = $128 \times 2.893 \times 10^{-3} = 0.370\text{ s}$ $\leq 0.4\text{ s}$  For test protocols please refer to Appendix 1.	
<b>Verdict:</b>	Pass	

**FCC 15.247 (a) – Hopping Sequence**
**Pass**

**FCC Requirement:** The system radio frequency (RF) bandwidth is equal to the channel bandwidth multiplied by the number of channels in the hopset. The hopset shall be such that the near-term distribution of frequencies appears random, with sequential hops randomly distributed in both direction and magnitude of change in the hopset, while the long-term distribution appears evenly distributed.

**Hopping sequence**

The channel is represented by a pseudo-random hopping sequence hopping through the 79 RF channels. The hopping sequence is unique for the piconet and is determined by the Bluetooth device address of the master. The X input determines the phase in the 32-hop segment, whereas Y1 and Y2 selects between master-to-slave and slave-to-master transmission. The inputs A to D determine the ordering within the segment, the inputs E and F determine the mapping onto the hop frequencies.


**Example data:**

Hop sequence {k} for CONNECTION STATE:

CLK start: 0x00000010

ULAP: 0x00000000

#ticks: 00 02 | 04 06 | 08 0a | 0c 0e | 10 12 | 14 16 | 18 1a | 1c 1e |

0x0000010:	08 66	10 70	12 19	14 23	16 01	18 05	20 33	22 37
0x0000030:	24 03	26 07	28 35	30 39	32 72	34 76	36 25	38 29
0x0000050:	40 74	42 78	44 27	46 31	48 09	50 13	52 41	54 45
0x0000070:	56 11	58 15	60 43	62 47	32 17	36 19	34 49	38 51
0x0000090:	40 21	44 23	42 53	46 55	48 33	52 35	50 65	54 67
0x00000b0:	56 37	60 39	58 69	62 71	64 25	68 27	66 57	70 59
0x00000d0:	72 29	76 31	74 61	78 63	01 41	05 43	03 73	07 75
0x00000f0:	09 45	13 47	11 77	15 00	64 49	66 53	68 02	70 06
0x0000110:	01 51	03 55	05 04	07 08	72 57	74 61	76 10	78 14
0x0000130:	09 59	11 63	13 12	15 16	17 65	19 69	21 18	23 22
0x0000150:	33 67	35 71	37 20	39 24	25 73	27 77	29 26	31 30
0x0000170:	41 75	43 00	45 28	47 32	17 02	21 04	19 34	23 36
0x0000190:	33 06	37 08	35 38	39 40	25 10	29 12	27 42	31 44
0x00001b0:	41 14	45 16	43 46	47 48	49 18	53 20	51 50	55 52
0x00001d0:	65 22	69 24	67 54	71 56	57 26	61 28	59 58	63 60
0x00001f0:	73 30	77 32	75 62	00 64	49 34	51 42	57 66	59 74
0x0000210:	53 36	55 44	61 68	63 76	65 50	67 58	73 03	75 11
0x0000230:	69 52	71 60	77 05	00 13	02 38	04 46	10 70	12 78
0x0000250:	06 40	08 48	14 72	16 01	18 54	20 62	26 07	28 15
0x0000270:	22 56	24 64	30 09	32 17	02 66	06 74	10 19	14 27
0x0000290:	04 70	08 78	12 23	16 31	18 03	22 11	26 35	30 43
0x00002b0:	20 07	24 15	28 39	32 47	34 68	38 76	42 21	46 29
0x00002d0:	36 72	40 01	44 25	48 33	50 05	54 13	58 37	62 45
0x00002f0:	52 09	56 17	60 41	64 49	34 19	36 35	50 51	52 67
0x0000310:	38 21	40 37	54 53	56 69	42 27	44 43	58 59	60 75
0x0000330:	46 29	48 45	62 61	64 77	66 23	68 39	03 55	05 71
0x0000350:	70 25	72 41	07 57	09 73	74 31	76 47	11 63	13 00
0x0000370:	78 33	01 49	15 65	17 02	66 51	70 67	03 04	07 20
0x0000390:	68 55	72 71	05 08	09 24	74 59	78 75	11 12	15 28
0x00003b0:	76 63	01 00	13 16	17 32	19 53	23 69	35 06	39 22
0x00003d0:	21 57	25 73	37 10	41 26	27 61	31 77	43 14	47 30
0x00003f0:	29 65	33 02	45 18	49 34	19 04	21 08	23 20	25 24

FCC 15.247 (a) – Equal Hopping Frequency Use	Pass
<b>FCC Requirement:</b> Each of the transmitter's hopping channels is used equally on average.	
The system radio frequency (RF) bandwidth is equal to the channel bandwidth multiplied by the number of channels in the hopset. The hopset shall be such that the near-term distribution of frequencies appears random, with sequential hops randomly distributed in both direction and magnitude of change in the hopset, while the long-term distribution appears evenly distributed.	
Equal hopping frequency use The EUT complies with the Bluetooth RF specifications. For details refer to the Bluetooth standard.	
FCC 15.247 (a) – Receiver Input Bandwidth	Pass
<b>FCC Requirement:</b> The associated receiver(s) complies with the requirement that its input bandwidth matches the bandwidth of the transmitted signal.	
Receiver input bandwidth The receiver bandwidth is equal to the receiver bandwidth in the 79 hopping channel mode, which is 1 MHz.	
FCC 15.247 (a) – Receiver Hopping Capability	Pass
<b>FCC Requirement:</b> The associated receiver has the ability to shift frequencies in synchronisation with the transmitted signals.	
Receiver hopping Capability The EUT complies with the Bluetooth RF specifications. For details refer to the Bluetooth standard.	

<b>FCC 15.247 (d) – Spurious Conducted Emissions</b>						<b>Pass</b>
Test Specification : ANSI C63.10 – 2013						
Mode of operation : Tx mode						
Port of testing : Temporary antenna port						
Supply voltage : 3.7V internal battery						
Temperature : 23 °C						
Humidity : 50 %						
<b>FCC Requirement:</b> 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.						
<b>Results:</b> Pre-scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and packet types.  There is no peak found outside any 100kHz bandwidth of the operating frequency band in the three transmit frequency. All three transmit frequency modes comply with the limit stated in subclause 15.247(d). For test protocols refer to Appendix 1.						
Modulation	Operating frequency (MHz)	Spurious frequency (MHz)	Spurious Level (dBm)	Reference value (dBm)	Delta (dB)	Verdict
GFSK	2402	4807.500	-31.38	8.32	-39.70	Pass
GFSK	2441	4885.700	-28.90	9.67	-38.57	Pass
GFSK	2480	4963.800	-29.32	9.51	-38.83	Pass
8DPSK	2402	4807.500	-36.95	4.82	-41.77	Pass
8DPSK	2441	4885.700	-32.53	6.49	-39.02	Pass
8DPSK	2480	4963.800	-32.64	6.77	-39.41	Pass

FCC 15.205 – Radiated Emissions in Restricted Frequency Bands		Pass
Test Specification : ANSI C63.10 – 2013		
Mode of operation : TX mode		
Supply voltage : 3.7V internal battery		
Temperature : 23°C		
Humidity : 50%		
<b>FCC Requirement:</b> In any 100kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. In addition, radiated emissions which fall in the restricted bands, as defined in section 15.205(a), must also comply with the radiated emission limits specified in section 15.205(c).		
<b>Results:</b> Pre-scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and data rate.		
All three transmit frequency modes comply with the field strength within the restricted bands. There is no spurious found below 30MHz.		
Mode: 2402 MHz TX		Vertical Polarization
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
798.980	33.03	46.0 / QP
2400.000	40.07	74.0 / PK
2400.000	31.63	54.0 / AV
4804.180	46.89	74.0 / PK
4804.180	42.72	54.0 / AV
7206.000	42.86	74.0 / PK
7206.000	37.96	54.0 / AV
Mode: 2402 MHz TX		Horizontal Polarization
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
815.968	32.68	46.0 / QP
2400.000	43.76	74.0 / PK
2400.000	33.02	54.0 / AV
4804.170	47.19	74.0 / PK
4804.170	42.17	54.0 / AV
7206.000	46.15	74.0 / PK
7206.000	41.25	54.0 / AV
Mode: 2441 MHz TX		Vertical Polarization
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
798.980	33.15	46.0 / QP
4882.023	47.42	74.0 / PK
4882.023	43.26	54.0 / AV
7323.000	45.75	74.0 / PK
7323.000	41.21	54.0 / AV

Mode: 2441 MHz TX		
Horizontal Polarization		
<b>Freq MHz</b>	<b>Level dBuV/m</b>	<b>Limit/ Detector dBuV/m</b>
821.710	32.73	46.0 / QP
4882.068	48.10	74.0 / PK
4882.068	43.94	54.0 / AV
7323.000	44.97	74.0 / PK
7323.000	39.43	54.0 / AV

Mode: 2480 MHz TX		
Vertical Polarization		
<b>Freq MHz</b>	<b>Level dBuV/m</b>	<b>Limit/ Detector dBuV/m</b>
798.980	32.28	46.0 / QP
4960.022	46.84	74.0 / PK
4960.022	42.80	54.0 / AV
7440.000	46.66	74.0 / PK
7440.000	42.45	54.0 / AV
2483.500	37.86	74.0 / PK
2483.500	27.08	54.0 / AV

Mode: 2480 MHz TX		
Horizontal Polarization		
<b>Freq MHz</b>	<b>Level dBuV/m</b>	<b>Limit/ Detector dBuV/m</b>
827.493	33.04	46.0 / QP
4960.013	50.11	74.0 / PK
4960.013	45.06	54.0 / AV
7440.000	45.84	74.0 / PK
7440.000	39.63	54.0 / AV
2483.500	39.69	74.0 / PK
2483.500	30.92	54.0 / AV