

TEST REPORT

Product : Suunto Wing
Trade mark : SUUNTO
Model/Type reference : HS231
Serial Number : N/A
Report Number : EED32P80497802
Date of Issue : Jun. 19, 2023
Product Class : Item 19 of Article 2 Paragraph 1
Test result : PASS

Prepared for:

Suunto Sports Technology(Dongguan)Co., Ltd.
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Check No.: 8042110423



2 Version

Version No.	Date	Description
00	Jun. 19, 2023	Original

3 Test Summary

Test	Test Requirement	Limit/Severity	Result
Antenna Requirement	Item 19 of Article 2 Paragraph 1	Notice 88 Appendix 43,B-1 (1)&(2)	PASS
Test frequency	Item 19 of Article 2 Paragraph 1	Notice 88 Appendix 43, A-3	PASS
Frequency Error	Item 19 of Article 2 Paragraph 1	±50 PPM or less	PASS
Occupied Bandwidth	Item 19 of Article 2 Paragraph 1	83.5 MHz or less	PASS
Spread-spectrum Bandwidth	Item 19 of Article 2 Paragraph 1	500 kHz or more	PASS
Antenna Power	Item 19 of Article 2 Paragraph 1	Designated value: (1)FH, FH+DS , FH+OFDM 3mW/MHz (Used in the range of 2400-2483.5MHz) (2) OFDM , DS other than (1) : 10mW/MHz (3) Other than (1) & (2) 10mW Tolerance: +20%,-80%	PASS
Spurious Emission of Tx	Item 19 of Article 2 Paragraph 1	(1) Below 2387 MHz : -26dBm (2) 2387 to 2400 MHz : -16dBm (3) 2483.5 through 2496.5 MHz : -16dBm (4) Over 2496.5 MHz : -26dBm	PASS
Dwell Time	Item 19 of Article 2 Paragraph 1	less than 0.4sec	PASS
Pseudorandom Frequency Hopping Sequence	Item 19 of Article 2 Paragraph 1	Notice 88 Appendix 43, 44, 45	N/A
Interference prevention capability	Item 19 of Article 2 Paragraph 1	Notice 88 Appendix 43, 44, 45	N/A
RF accessibility	Item 19 of Article 2 Paragraph 1	Notice 88 Appendix 43, 44, 45	PASS
Spurious Emission of Rx	Item 19 of Article 2 Paragraph 1	(1) Below 1 GHz: -54dBm (2) 1GHz or higher: -47dBm	PASS

Remark:

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

EUT: In this whole report EUT means Equipment Under Test.

Tx: In this whole report Tx (or tx) means the product in transmitting status.

Rx: In this whole report Rx (or rx) means the product in receiving status.

RF: In this whole report RF means Radiated Frequency.

DS: Direct spreading FH: Frequency hopping

OFDM: Orthogonal frequency division multiplexing.

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5 General Information

5.1 Client Information

Applicant:	Suunto Sports Technology(Dongguan)Co., Ltd.
Address of Applicant:	Room 108, No. 5, Longxi Road, Nancheng Street, Dongguan City, Guangdong Province
Manufacturer:	Suunto Sports Technology(Dongguan)Co., Ltd.
Address of Manufacturer:	Room 108, No. 5, Longxi Road, Nancheng Street, Dongguan City, Guangdong Province
Factory:	Suunto Sports Technology(Dongguan)Co., Ltd.
Address of Factory:	Room 108, No. 5, Longxi Road, Nancheng Street, Dongguan City, Guangdong Province

5.2 General Description of EUT

Product Name:	Suunto Wing
Model No.:	HS231
Trade Mark:	SUUNTO
EUT Supports Radios application:	BT Double module, 2402MHz to 2480MHz
Operating Frequency:	2402 MHz to 2480 MHz
Conducted rated power:	GFSK: 0.8mW/MHz, ($\pi/4$)DQPSK: 0.8mW/MHz, 8DPSK: 0.8mW/MHz
Number of Channels:	79 Channels
Type of Modulation:	GFSK, $\pi/4$ DQPSK, 8DPSK
Channel Separation:	1 MHz
Antenna Type:	PIFA Antenna
Antenna gain:	1.23dBi
Test Power Grade:	Default
Test Software of EUT:	BlueTest3
Power Supply:	Battery DC 3.8V
Test Voltage:	DC 3.8V
Sample Received Date:	Apr. 11, 2023
Sample tested Date:	Apr. 11, 2023 to Apr. 15, 2023

5.3 EUT test environment range

Temperature:	23 °C
Humidity:	54% RH
Atmospheric Pressure:	1010 mbar

5.4 Description of Support Units

The EUT has been tested with associated equipment below.

Description	Manufacturer	Model No.	Certification	Supplied by
Netbook	HP	ProBook	MIC	CTI

5.5 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 3368 3668 Fax: +86 (0) 755 3368 3385

No tests were sub-contracted.

6 Equipment List

RF test system					
Equipment	Manufacturer	Model No.	Serial Number	Cal. Date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
Spectrum Analyzer	Keysight	N9010A	MY54510339	12-23-2022	12-22-2023
Signal Generator	Keysight	N5182B	MY53051549	12-19-2022	12-18-2023
Signal Generator	Agilent	N5181A	MY46240094	12-19-2022	12-18-2023
DC Power	Keysight	E3642A	MY56376072	12-19-2022	12-18-2023
Wi-Fi 7GHz Band Extender	JS Tonscend	TS-WF7U2	2206200002	06-11-2022	06-10-2023
RF control unit	JS Tonscend	JS0806-2	158060006	12-23-2022	12-22-2023
Communication test set	R&S	CMW500	120765	12-23-2022	12-22-2023
high-low temperature test chamber	Dong Guang Qin Zhuo	LK-80GA	QZ20150611879	12-19-2022	12-18-2023
Temperature/Humidity Indicator	biaozhi	HM10	1804186	07-01-2022	06-15-2023
BT&WI-FI Automatic test software	JS Tonscend	JS1120-3	2.6.77.0518	---	---

Remark:

- (a) Calibration conducted by the National Institute of Information and Communications Technology (NICT) in Japan (hereinafter referred to as "NICT") or a designated calibration agency under Article 102-18 paragraph (1) in JRL.
- (b) Correction conducted pursuant to the provisions of Article 135 or Article 144 of the Measurement Act (Act No. 51 of 1992) .
- (c) Calibration conducted in countries except Japan, which shall be equivalent to the calibration conducted by the NICT or a designated calibration agency under Article 102-18 paragraph (1).
- (d) Calibration, etc. conducted by using measuring instruments and other equipment listed in the right column of appended table No. 3, which shall have been given any type of calibration, etc. listed above from (a) to(c).

From JRL Article 24-2, paragraph 4, Item 2

Notice: Calibration duration for above equipment is 1 year.

7 Radio Technical Requirements Specification

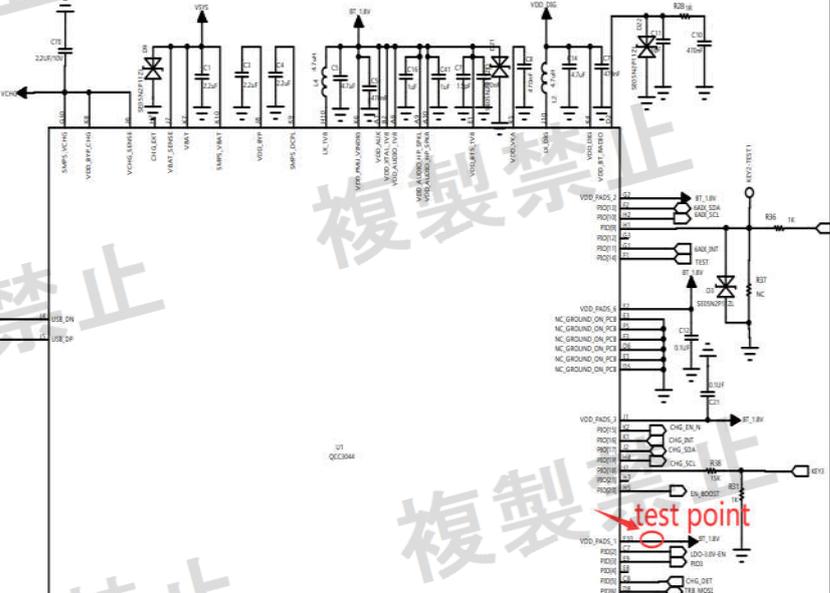
Table 1: Radio Technical Requirements Specification for 2.4 GHz band wide-band low-power data communication system (Item 19 of Article 2 Paragraph 1)

Items	Technical standard
Assigned frequency or designated frequency	2400-2483.5MHz
Communication method	One-way communication, simplex, semi-duplex, or duplex operation of digital signal transmission including spread spectrum
Tolerance of frequency ($\times 10^{-6}$)	± 50 PPM
Tolerance of occupied bandwidth	FH: 83.5MHz or less FH + OFDM: 83.5MHz or less Others: 26MHz or less FH + DS: 83.5MHz or less OFDM: 38MHz or less
Antenna power	Designated value (1) FH, FH+DS , FH+OFDM: 3mW/MHz (used in the range of 2400-2483.5MHz) (2) OFDM , DS other than (1): 10mW/MHz (3) Other than (1) & (2): 10mW Tolerance : +20%,-80%
Antenna gain	1) 12.14 dBi or less in principle 2) In case of directional antenna (1) FH, FH+DS or FH+OFDM using 2427-2470.75 MHz
Tolerance of spurious intensity	(1) Below 2387 MHz: 2.5 μ W (2) 2387 to 2400 MHz: 25 μ W (3) 2483.5 through 2496.5 MHz: 25 μ W (4) Over 2496.5 MHz: 2.5 μ W
Spreading bandwidth	500kHz or more
Limit of secondary radiated emissions	(1) Below 1 GHz: 4nW (2) 1 GHz or higher: 20nW
Interference prevention function	Shall have the function of automatic transmission and reception of identification sign.
Structure	Shall be of the structure that the RF and modulator sections excluding antenna cannot easily be opened.
Note	DS: Direct spread OFDM: Orthogonal frequency division multiplexing FH: Frequency hopping

Note: The Technical Standards described here do not cover all of the regulated items.

7.1 Transmitter Requirements

7.1.1 EUT test voltage and Frequency

EUT test voltage	
Power Supply:	Battery DC 3.8V
Test voltage require:	Supply the rated voltage and the rated voltage $\pm 10\%$ to power supply. However, If the fluctuation of input voltage to the circuit of RF unit (except power supply) of test equipment is under $\pm 1\%$, when input voltage from external power supply to the test equipment is fluctuated by $\pm 10\%$: Conduct the test with the rated voltage only.
RF circuit test points:	 <p>The diagram illustrates the RF circuit test points for the transmitter. It shows a complex network of components including capacitors (e.g., 100nF, 10nF, 1uF), inductors (e.g., 4.7nH, 100nH), and various test points. Key test points are labeled with VDD and RF signals, such as VDD_PAD1.1, VDD_PAD1.2, VDD_PAD1.3, VDD_PAD1.4, VDD_PAD1.5, VDD_PAD1.6, VDD_PAD1.7, VDD_PAD1.8, VDD_PAD1.9, VDD_PAD1.10, VDD_PAD1.11, VDD_PAD1.12, VDD_PAD1.13, VDD_PAD1.14, VDD_PAD1.15, VDD_PAD1.16, VDD_PAD1.17, VDD_PAD1.18, VDD_PAD1.19, VDD_PAD1.20, VDD_PAD1.21, VDD_PAD1.22, VDD_PAD1.23, VDD_PAD1.24, VDD_PAD1.25, VDD_PAD1.26, VDD_PAD1.27, VDD_PAD1.28, VDD_PAD1.29, VDD_PAD1.30, VDD_PAD1.31, VDD_PAD1.32, VDD_PAD1.33, VDD_PAD1.34, VDD_PAD1.35, VDD_PAD1.36, VDD_PAD1.37, VDD_PAD1.38, VDD_PAD1.39, VDD_PAD1.40, VDD_PAD1.41, VDD_PAD1.42, VDD_PAD1.43, VDD_PAD1.44, VDD_PAD1.45, VDD_PAD1.46, VDD_PAD1.47, VDD_PAD1.48, VDD_PAD1.49, VDD_PAD1.50, VDD_PAD1.51, VDD_PAD1.52, VDD_PAD1.53, VDD_PAD1.54, VDD_PAD1.55, VDD_PAD1.56, VDD_PAD1.57, VDD_PAD1.58, VDD_PAD1.59, VDD_PAD1.60, VDD_PAD1.61, VDD_PAD1.62, VDD_PAD1.63, VDD_PAD1.64, VDD_PAD1.65, VDD_PAD1.66, VDD_PAD1.67, VDD_PAD1.68, VDD_PAD1.69, VDD_PAD1.70, VDD_PAD1.71, VDD_PAD1.72, VDD_PAD1.73, VDD_PAD1.74, VDD_PAD1.75, VDD_PAD1.76, VDD_PAD1.77, VDD_PAD1.78, VDD_PAD1.79, VDD_PAD1.80, VDD_PAD1.81, VDD_PAD1.82, VDD_PAD1.83, VDD_PAD1.84, VDD_PAD1.85, VDD_PAD1.86, VDD_PAD1.87, VDD_PAD1.88, VDD_PAD1.89, VDD_PAD1.90, VDD_PAD1.91, VDD_PAD1.92, VDD_PAD1.93, VDD_PAD1.94, VDD_PAD1.95, VDD_PAD1.96, VDD_PAD1.97, VDD_PAD1.98, VDD_PAD1.99, VDD_PAD1.100. A red circle highlights a specific test point labeled 'test point'.</p>

Power Supply result:	The measurement result of the voltage fluctuation at RF circuit when DC 3.8V +/- 10%.	
	DC Input	RF circuit
	4.18V	1.800V
	3.80V	1.800V
	3.42V	1.800V

7.1.1.1 Test frequency

Test frequencies:	If the EUT can be set to 3 or more different (carrier) frequencies in 1 allocated band, testing shall be performed using the Lowest, Middle and the Highest frequency (L,M and H). If there are 2 or fewer frequencies, testing shall be performed with the available frequencies.		
	Frequency range over which device operates	Number of frequencies	Location in the range of operation
	1 MHz or less	1	Middle
	1 to 10 MHz	2	1 near top and 1 near bottom
	More than 10 MHz	3	1 near top, 1 near middle and 1 near bottom

EUT channels and frequencies list:

Channel	Frequency (MHz)						
0	2402	20	2422	40	2442	60	2462
1	2403	21	2423	41	2443	61	2463
2	2404	22	2424	42	2444	62	2464
3	2405	23	2425	43	2445	63	2465
4	2406	24	2426	44	2446	64	2466
5	2407	25	2427	45	2447	65	2467
6	2408	26	2428	46	2448	66	2468
7	2409	27	2429	47	2449	67	2469
8	2410	28	2430	48	2450	68	2470
9	2411	29	2431	49	2451	69	2471
10	2412	30	2432	50	2452	70	2472
11	2413	31	2433	51	2453	71	2473
12	2414	32	2434	52	2454	72	2474
13	2415	33	2435	53	2455	73	2475
14	2416	34	2436	54	2456	74	2476
15	2417	35	2437	55	2457	75	2477
16	2418	36	2438	56	2458	76	2478
17	2419	37	2439	57	2459	77	2479
18	2420	38	2440	58	2460	78	2480
19	2421	39	2441	59	2461	N/A	N/A

Test frequencies are the lowest channel: 0 channel (2402 MHz), Middle channel: 39 channel (2441 MHz) And highest channel: 78 channel (2480 MHz)

7.1.2 Antenna Requirement

Standard requirement	
Applicable for equipment with an antenna terminal, including testing terminals) If an antenna connector is available, all relevant tests will be carried out conducted. If not, tests will be carried out in an anechoic room or with a suitable test-fixture.	
EUT Antenna	
The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 1.23dBi.	
Result: An antenna connector is available, all relevant tests will be carried out conducted.	

7.1.3 Frequency Error

Measurement Record:

Uncertainty: $\pm 10\text{Hz}$

Test Requirement:	Item 19 of Article 2 Paragraph 1		
Test Method:	MIC Notice No.88 Appendix No.43		
EUT Operation:			
Ambient:	Temp.: 23°C	Humid.54%	Press.: 1010mbar
Test Status:	Enter the unmodulation mode for the product. Test in Channel lowest (2402MHz), middle (2441MHz) and highest (2480MHz), keep in continuously transmitting status.		
Test Configuration:	<div style="display: flex; align-items: center; justify-content: center;"> <div style="border: 1px solid black; padding: 5px; margin-right: 10px;">EUT</div> → <div style="border: 1px solid black; padding: 5px; margin-right: 10px;">Spectrum Analyzer</div> </div>		
Test Conditions:	Frequency Counter or Spectrum Analyzer is used for measurement.		
EUT conditions:	Modulation/Spread/Hopping off, CW Tx If EUT does not accept "Modulation OFF" mode in the measurement, you may use "Modulation ON" mode. In that case you can use the Max power Frequency as the measuring results.		
Spectrum Analyzer conditions:	Frequency: Test Frequency Span 1MHz RBW 10KHz (Modulation OFF), VBW 10KHz (Modulation OFF), Sweep Time Auto Detector mode Positive peak Indication mode Max hold		
Technical standard:	Tolerance of frequency: $\pm 50 \times 10^{-6}$		
Test result:	Refer to Appendix: BT Classic of Report No. EED32P80497802		

7.1.4 Occupied Bandwidth (99%)

Measurement Record:

Uncertainty: $\pm 10\text{KHz}$

Test Requirement:	Item 19 of Article 2 Paragraph 1
Test Method:	MIC Notice No.88 Appendix No.43
EUT Operation:	
Ambient:	Temp.: 23°C Humid.:54% Press.: 1010mbar
Test Status:	Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.
Test Configuration:	
	
EUT conditions:	Modulation/Spread/Hopping on, PN9 Modulation Tx For equipment using diffusion code, set to the test diffusion code and modulate with standard coding test signal.
Spectrum Analyzer conditions:	Frequency: Test Frequency Span 120MHz (FHSS), RBW 1MHz VBW 1MHz Sweep Time Auto detector mode Positive peak Indication mode Max hold OBW 99%
Technical standard:	FH : 83.5MHz
Test result:	Refer to Appendix: BT Classic of Report No. EED32P80497802

7.1.5 Spread spectrum Bandwidth (90%)

Measurement Record:

Uncertainty: $\pm 10\text{KHz}$

Test Requirement:	Item 19 of Article 2 Paragraph 1		
Test Method:	MIC Notice No.88 Appendix No.43		
EUT Operation:	Ambient: Temp.: 23°C Humid.: 54% Press.: 1010mbar		
Test Status:	Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).Following channel(s) was (were) selected for the final test as listed below.		
Test Configuration:	 <pre> graph LR EUT[EUT] --> SA[Spectrum Analyzer] </pre>		
EUT conditions:	Modulation/Spread/Hopping on, PN9 Modulation Tx For equipment using diffusion code, set to the test diffusion code and modulate with standard coding test signal.		
Spectrum Analyzer conditions:	Frequency: Test Frequency Span 120MHz (FHSS), RBW 1MHz VBW 1MHz Sweep Time Auto detector mode Positive peak Indication mode Max hold OBW 90%		
Technical standard:	500kHz or more		
Test result:	Refer to Appendix: BT Classic of Report No. EED32P80497802		

7.1.6 Antenna Power

Measurement Record:

Uncertainty: ± 10 kHz / ± 1 dB

Test Requirement:	Item 19 of Article 2 Paragraph 1		
Test Method:	MIC Notice No.88 Appendix No.43		
EUT Operation:			
Ambient:	Temp.: 23°C	Humid.:54%	Press.: 1010 mbar
Test Status:	Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.		
Test Configuration:	<div style="display: flex; align-items: center; justify-content: center;"> <div style="border: 1px solid black; padding: 5px; margin-right: 10px;">EUT</div> → <div style="border: 1px solid black; padding: 5px; margin-left: 10px;">Spectrum Analyzer</div> </div>		
EUT conditions:	Modulation/Spread/Hopping on, PN9 Modulation Tx For equipment using diffusion code, set to the test diffusion code and modulate with standard coding test signal.		
Spectrum Analyzer conditions(FHSS):	1. Search for peak power frequency Frequency: 2441MHz Span :100MHz RBW :1MHz VBW :3MHz Sweep Time: Auto Detector mode: Positive peak Indication mode: Max hold 2. Measurement of average antenna power Center frequency: Frequency of peak power found using Span: 0 Hz RBW: 1MHz VBW :1MHz Detector mode: Sample Sweep time: Minimum time required to make an accurate measurement. For burst type (intermittent) transmission, sweep time shall be greater than one burst interval. Sweep data points: 1001 or greater		
Technical standard:	Antenna Power (1) FH, FH+DS , FH+OFDM 3mW/MHz or less (used in the range of 2400-2483.5MHz) (2) OFDM , DS other than (1) 10mW/MHz or less (3) Other than (1) & (2) 10mW or less Tolerance: +20% -80%		
Test result:	Refer to Appendix: BT Classic of Report No. EED32P80497802		

7.1.7 Spurious Emissions of Tx

Measurement Record:

Uncertainty: $\pm 1\text{dB}$

Test Requirement:	Item 19 of Article 2 Paragraph 1		
Test Method:	MIC Notice No.88 Appendix No.43		
EUT Operation:	Ambient: Temp.: 23°C Humid.:54% Press.: 1010 mbar		
Test Status:	Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.		
Test Configuration:	<div style="display: flex; align-items: center; justify-content: center;"> <div style="border: 1px solid black; padding: 5px; margin-right: 10px;">EUT</div> <div style="font-size: 24px; margin-right: 10px;">→</div> <div style="border: 1px solid black; padding: 5px; margin-left: 10px;">Spectrum Analyzer</div> </div>		
EUT conditions:	Modulation/Spread/Hopping on, PN9 Modulation Tx For equipment using diffusion code, set to the test diffusion code and modulate with standard coding test signal.		
Measurement Procedure:	Step1 All spurious are measured from 30MHz to 13GHz by peak mode. Step2 IF the value measured by Step1 is 2dB or less, measure in average mode.		
Spectrum Analyzer conditions(Step 1):	Frequency: 30MHz – 2400MHz , 2483.5MHz –13GHz RBW 1000kHz (30 – 1GHz) , 1000KHz (over 1GHz) VBW 1000kHz (30 – 1GHz) , 1000KHz (over 1GHz) Sweep Time Auto detector mode Positive peak Indication mode Max hold		
Spectrum Analyzer conditions(Step 2):	Frequency: Spurious Frequency Span 0Hz RBW 1MHz VBW 1MHz Sweep Time Auto Detector mode Sample Indication mode Max hold		
Technical standard:	(1) Below 2387 MHz : 2.5 $\mu\text{W}/\text{MHz}$ (2) 2387 to 2400 MHz : 25 $\mu\text{W}/\text{MHz}$ (3) 2483.5 through 2496.5 MHz : 25 $\mu\text{W}/\text{MHz}$ (4) Over 2496.5 MHz : 2.5 $\mu\text{W}/\text{MHz}$		
Test result:	Refer to Appendix: BT Classic of Report No. EED32P80497802		

7.1.8 Dwell Time

Test Requirement:	Item 19 of Article 2 Paragraph 1		
Test Method:	MIC Notice No.88 Appendix No.43		
EUT Operation:			
Ambient:	Temp.: 23°C	Humid.: 54%	Press.: 1010 mbar
Test Status:	Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below. Modulation/Spread/Hopping ON, Hopping frequency is fixed, Bluetooth equipment is setting DH5 mode		
Test Configuration:	<div style="text-align: center;">  <pre> graph LR EUT[EUT] --> SA[Spectrum Analyzer] </pre> </div>		
EUT conditions:	Modulation/Spread/Hopping ON, Hopping frequency is fixed, Bluetooth equipment is setting DH5 mode For equipment using diffusion code, set to the test diffusion code and modulate with standard coding test signal.		
Spectrum Analyzer conditions:	Frequency: Test Frequency (fixed hopping frequency) Span 0 Hz RBW 1 MHz VBW 1 MHz Sweep Time EUT condition Trigger Video Trigger Measures the Transmission time of 1 burst (sec) Measures the Burst cycle (sec)		
Calculation procedure :	$\text{Dwell time} = (0.4(\text{s}) \times [\text{spreading factor}] \times [\text{Transmission time of 1 burst}(\text{s})]) / ([\text{burst cycle}(\text{s})] \times [\text{No. of hopping channel}])$		
Technical standard:	Less than 0.4 sec		
Test result:	Refer to Appendix: BT Classic of Report No. EED32P80497802		

7.1.9 Pseudorandom Frequency Hopping Sequence

Standard requirement

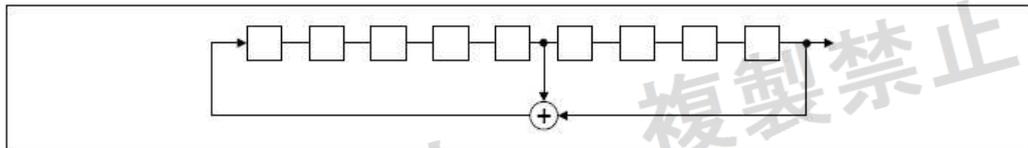
Article 2, Item (19) Notice 88 Appendix 43, 44, 45 requirement:

The EUT shall have the capability to transmit or to receive the MAC identification automatically, so that sender and receiver shall exclude other equipment.

EUT Pseudorandom Frequency Hopping Sequence

The pseudorandom sequence may be generated in a nine-stage shift register whose 5th and 9th stage outputs are added in a modulo-two addition stage. and the result is fed back to the input of the first stage. The sequence begins with the first ONE of 9 consecutive ONES; i.e. the shift register is initialized with nine ones.

- Number of shift register stages: 9
- Length of pseudo-random sequence: $2^9 - 1 = 511$ bits
- Longest sequence of zeros: 8 (non-inverted signal)



Linear Feedback Shift Register for Generation of the PRBS sequence

An example of Pseudorandom Frequency Hopping Sequence as follow:



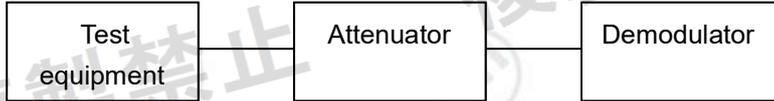
Each frequency used equally on the average by each transmitter.

The system receivers have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shift frequencies in synchronization with the transmitted signals.

7.1.10 Interference prevention function

1) Measurement system diagram

(1) When transmitting identification code



2) Condition of measuring instrument

(1) Demodulator must be able to demodulate the transmitting signal emitted by test equipment and to indicate the identification code.

3) Condition of test equipment The mode of normal use.

4) Measuring operation procedure

(1) When test equipment has the function to transmit identification code automatically:

A) Transmit the predetermined identification code from test equipment.

B) Confirm the transmitted identification code by demodulator.

MAC:



5) Test result: The unit does meet the requirements (Good).

Test result: PASS

7.1.11 RF accessibility

Standard requirement

Article 49-20, paragraph 1 (a)

The EUT shall be constructed in such a way that sensitive RF parts, (like modulation and oscillator parts) cannot be reached easily by the user. These parts shall be covered by soldered metal caps or glue or by other mechanical covers. If the covers are fixed with screws, these shall be not the common type(s) like a Phillips, but special versions like Torx, so that the user cannot open the device with common tools.

<input type="checkbox"/> Sealed with special screws.
<input type="checkbox"/> Plastic chassis is being welded using ultrasonic waves.
<input type="checkbox"/> Chassis is glued using a special adhesive.
<input type="checkbox"/> Metal covers are spot-fused.
<input type="checkbox"/> Cover is specially interlocked.
<input type="checkbox"/> RF and Modulation components are covered with shielding case and this shielding case is soldered.
<input type="checkbox"/> Shield case is welded at RF and modulation parts, and ID-ROM is welded using the BGA Method.
<input type="checkbox"/> Shield case is welded at RF and modulation parts, and ID-ROM is glued at its lead with a special adhesive.
<input type="checkbox"/> Shield case is welded at RF and modulation parts, and ID-ROM is glued with anon-transparent laminating agent.
<input checked="" type="checkbox"/> RF and Modulation parts are mounted on PCB with surface mount technology, the antenna is printed on PCB, chip is welded on PCB, and there is no any adjustable parts on PCB or adjustable parts are not exposed. The interval of terminals: 0.5 mm Number of terminals: 33
<input type="checkbox"/> Enclosure protection

7.2 Receiver Requirements

7.2.1 Spurious Emissions of Rx

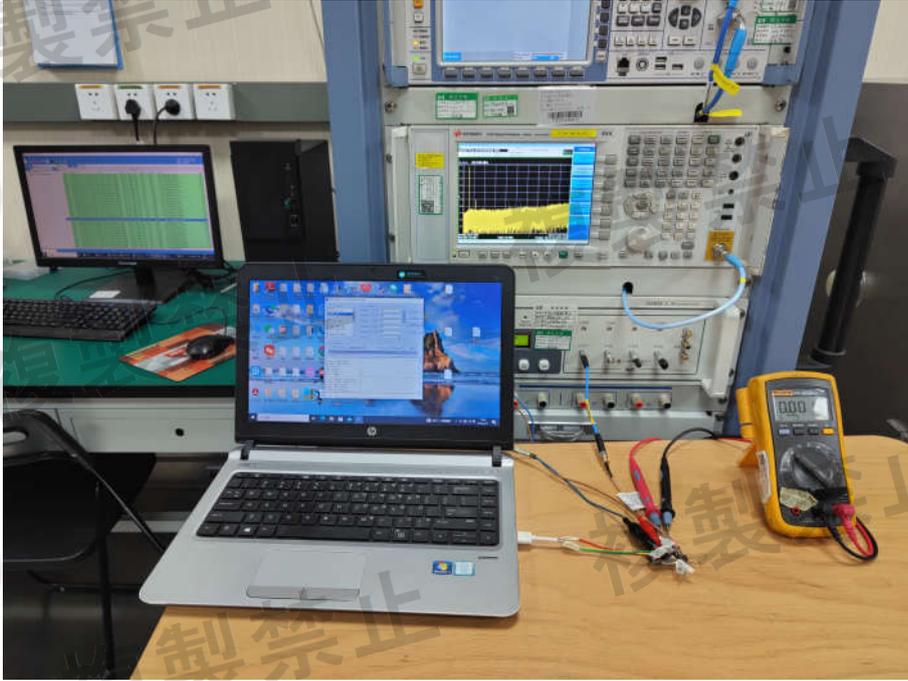
Measurement Record:

Uncertainty: $\pm 1\text{dB}$

Test Requirement:	Item 19 of Article 2 Paragraph 1		
Test Method:	MIC Notice No.88 Appendix No.43		
EUT Operation:			
Ambient:	Temp.: 23°C	Humid.:54%	Press.: 1010mbar
Test Status:	Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.		
Test Configuration:	 <pre> graph LR EUT[EUT] --> SA[Spectrum Analyzer] </pre>		
EUT conditions:	Rx		
Measurement Procedure:	Step 1 All spurious are measured from 30 MHz to 12.75 GHz by peak mode. Step 2 IF the value measured by Step1 is 2 dB or less, measure in average mode.		
Spectrum Analyzer conditions(Step 1):	Frequency: 30 MHz – 2400 MHz , 2483.5 MHz –12.75 GHz RBW 100 kHz (30 – 1GHz) , 1 MHz (over 1GHz) VBW 100 kHz (30 – 1GHz) , 1 MHz (over 1GHz) Sweep Time Auto detector mode Positive peak Indication mode Max hold		
Spectrum Analyzer Conditions(Step 2):	Frequency: Spurious Frequency Span 0 Hz RBW 100 kHz (30 – 1GHz) , 1 MHz (over 1GHz) VBW 100 kHz (30 – 1GHz) , 1 MHz (over 1GHz) Sweep Time Auto detector mode Sample Indication mode Max hold		
Technical standard:	(1) Below 1 GHz : 4 nW or less (2) 1 GHz and over : 20 nW or less		
Test result:	Refer to Appendix: BT Classic of Report No. EED32P80497802		

8 Photographs

8.1 EUT Test Setup



EUT Test Setup-1

8.2 EUT Constructional Details

Refer to Report No. EED32P80497801 for EUT external and internal photos

The test report is effective only with both signature and specialized stamp, the result(s) shown in this report refer only to the sample(s) tested. Without written approval of CTI, this report can't be reproduced except in full.

*** End of Report ***