CE RF Test Report

Test Standard(s):	EN 300328 V1.9.1 (2015-02)
Applicant:	EHOME PRODUCTS CO., LIMITED
Product Name:	Activity Tracker
Model:	WB102
Report No.:	ZKS161100228E-1
Tested Date:	2016-11-29 to 2016-12-08
Issued Date:	2016-12-10
Tested By :	William Liu (Engineer)
Approved By:	Lahm Peng (Manager)
Prepared By:	

Shenzhen ZRLK Testing Technology Co., Ltd.

6F, Fuxinfa Industrial Park, Liuxiandong, Xili Street, Nanshan District, Shenzhen, China

Tel.: +86-755-29305110 Fax.: +86-755-36602376 Website: www.zrlklab.com

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1. General Information

1.1 Product Information

Applicant and Manufacturer	
Applicant:	
Address of Applicant:	
Manufacturer:	
Address of Manufacturer:	

General Description of EUT	
Product Name:	Activity Tracker
Model No.:	WB102
Trade Name:	EHOME
Adding Model(s):	--
Rated Voltage:	DC 3.7V, Battery
Radio Technology:	Bluetooth V4.0 BLE
Note 1: The test data is gathered from a production sample, provided by the manufacturer.	

E.1 Product Information (Bluetooth BLE)	
a) Type of modulation:	☐ FHSS ☒ other forms of modulation
b) In case of FHSS modulation:	No
c) Adaptive / non-adaptive:	Adaptive equipment without a non-adaptive mode
d) In case of adaptive equipment:	The equipment has implemented an LBT based DAA mechanism
e) In case of non-adaptive equipment:	No
f) The worst case operational mode for each of the following tests	
RF output power:	BLE
Power spectrum density:	BLE
Occupied channel bandwidth:	BLE
Transmitter unwanted emissions in the OOB domain:	BLE
Transmitter unwanted emissions in the spurious domain:	BLE
Receiver spurious emissions:	BLE
g) Operating mode(antenna):	Single Antenna Equipment
h) In case of smart antenna Systems:	No

i) Operating frequency range(s) of the equipment:	2402MHz-2480MHz
j) Occupied channel bandwidth(s):	Bandwidth 1(Min): 1.01MHz Bandwidth 2(Max):1.01MHz
k) Type of equipment:	☒ Stand-alone ☐ Combined equipment ☐ Plug-in device
l) The extreme operating conditions	
Extreme voltage range:	DC 3.3V to 4.2V
Extreme temperature range:	-20℃ to 55℃
m) The intended combination(s) of the radio equipment power settings and one or more antenna assemblies and their corresponding e.i.r.p levels	
Antenna type:	☒ Integral Antenna ☐ Dedicated Antennas
Antenna gain:	0 dBi
n)Nominal voltage:	Battery DC 3.7V
o) Describe the test modes available which can facilitate testing:	Please refer to Section 1.4
p) The equipment type	Bluetooth
E.2 Power Level Setting	
Highest EIRP value:	-5.85dBm
Conducted power:	-5.85dBm
Listed as power setting:	Default
E.3 Additional Information	
Modulation:	GFSK
Unmodulated modes:	No
Duty cycle:	Continuous operation possible for testing purposes
Type of the UUT:	Production models
Supporting equipment:	Please refer to Section 1.1

1.2 Compliance Standards

Compliance Standards	
EN 300328	Electromagnetic compatibility and Radio spectrum Matters (ERM); Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using wide band modulation techniques; Harmonized EN covering essential requirements under article 3.2 of the R&TTE Directive
The objective of the manufacturer or applicant is to demonstrate compliance with the above standards.	
According to standards for test methodology	
EN 300328	Electromagnetic compatibility and Radio spectrum Matters (ERM); Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using wide band modulation techniques; Harmonized EN covering essential requirements under article 3.2 of the R&TTE Directive
All measurements contained in this report were conducted with all above standards	
Maintenance of compliance is the responsibility of the manufacturer or applicant. Any modification of the product, which result is lowering the emission, should be checked to ensure compliance has been maintained.	

1.3 Test Facilities

Shenzhen Academy of Metrology and Quality Inspection (CNAS Registration No.: L0579)
Shenzhen Academy of Metrology and Quality Inspection is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L0579. All measurement facilities used to collect the measurement data are located at Metrology and Quality Inspection Building, Central Section of LongZhu Road, Nanshan District, Shenzhen (518055)

1.4 Test Setup Information

List of Test Modes			
Test Mode	Description	Remark	
TM1	BLE	2402/2441/2480MHz	
TM2	Receiving	2402/2441/2480MHz	
List and Details of Auxiliary Cable			
Description	Length (M)	Shielded/Unshielded	With/Without Ferrite
--	--	--	--
List and Details of Auxiliary Equipment			
Description	Manufacturer	Model	Serial Number
--	--	--	--
The equipment under test (EUT) was configured to measure its highest possible emission level. The test modes were adapted according to the operation manual for use.			

Test Conditions					
	Normal	LTLV	LTHV	HTHV	HTLV
Temperature（℃）	20	-20	-20	55	55
Voltage（V）	3.7	3.3	4.2	4.2	3.3

1.5 Measurement Uncertainty

Parameter	Conditions	Uncertainty
RF Output Power	Conducted	±0.50dB
Occupied Bandwidth	---	±1×10-7
Power Spectral Density	Conducted	±0.65dB
Transmitter Spurious Emissions	Radiated	±4.93dB
Receiver Spurious Emissions	Radiated	±4.93dB

1.6 List of Test and Measurement Instruments

Description	Manufacturer	Model	Serial Number	Due. Date
Spectrum Analyzer	Agilent	N9010A	MY52221119	2017-08-30
Signal Generator	Agilent	N5171B	MY53050627	2017-08-30
Signal Generator	Agilent	N5182B	MY53051091	2017-08-30
Power Sensor	Agilent	U2021XA	MY54250019	2017-08-30
Power Sensor	Agilent	U2021XA	MY54250021	2017-08-30
Power Sensor	Agilent	U2021XA	MY54210040	2017-08-30
Power Sensor	Agilent	U2021XA	MY54260021	2017-08-30
Simultaneous Sampling	Agilent	U2531A	TW54243509	2017-08-30
Power Splitter	Mini-Circuits	Z4PD-642W-S+	N846501416	2017-08-30
Power Splitter	Mini-Circuits	ZFRSC-183-S+	F831301425	2017-08-30
Power Splitter	Mini-Circuits	ZFRSC-183-S+	F831301426	2017-08-30
Coupler	Mini-Circuits	ZADC-10-63-S+	F839301424	2017-08-30
EMI Test Receiver	Rohde & Schwarz	ESI26	838786/013	2017-08-30
Pre-amplifier	Compliance Direction	PAP-0118	24004	2017-08-30
Bilog Antenna	Chase	CBL6112B	2591	2017-08-30
Horn Antenna	Rohde & Schwarz	HF906	100014	2017-08-30

2. Summary of Test Results

Standards	Reference	Description of Test Items	Result
EN 300328	4.3.1.1 / 4.3.2.1	RF Output Power	Passed
	4.3.2.2	Power Spectral Density	Passed
	4.3.1.2 / 4.3.2.3	Duty Cycle, Tx-sequence, Tx-gap	N/A
	4.3.1.3	Dwell time, Minimum Frequency Occupation and Hopping Sequence	N/A
	4.3.1.4	Hopping Frequency Separation	N/A
	4.3.1.5 / 4.3.2.4	Medium Utilisation (MU) Factor	N/A
	4.3.1.6 / 4.3.2.5	Adaptivity (Adaptive Frequency Hopping)	N/A
	4.3.1.7 / 4.3.2.6	Occupied Channel Bandwidth	Passed
	4.3.1.8 / 4.3.2.7	Transmitter Unwanted Emissions in the Out-of-band Domain	Passed
	4.3.1.9 / 4.3.2.8	Transmitter Unwanted Emissions in the Spurious Domain	Passed
	4.3.1.10 / 4.3.2.9	Receiver Spurious Emissions	Passed
	4.3.1.11 / 4.3.2.10	Receiver Blocking	N/A
Passed: The EUT complies with the essential requirements in the standard Failed: The EUT does not comply with the essential requirements in the standard N/A: not applicable			

3. RF Output Power

3.1 Standard Applicable

According to Section 4.3.1.1.2, The maximum RF output power for adaptive Frequency Hopping equipment shall be equal to or less than 20 dBm. The maximum RF output power for non-adaptive Frequency Hopping equipment, shall be declared by the supplier. The maximum RF output power for this equipment shall be equal to or less than the value declared by the supplier. This declared value shall be equal to or less than 20 dBm.

According to Section 4.3.2.1.2, For adaptive equipment using wide band modulations other than FHSS, the maximum RF output power shall be 20 dBm. The maximum RF output power for non-adaptive equipment shall be declared by the supplier and shall not exceed 20 dBm. For non-adaptive equipment using wide band modulations other than FHSS, the maximum RF output power shall be equal to or less than the value declared by the supplier.

3.2 Test Procedure

According to section 5.3.2.2.1.1 of the standard EN 300328, the test procedure shall be as follows:
Step 1:
• Use a fast power sensor suitable for 2,4 GHz and capable of 1 MS/s.
• Use the following settings: - Sample speed 1 MS/s or faster.
- The samples must represent the power of the signal.
- Measurement duration: For non-adaptive equipment: equal to the observation period defined in clauses 4.3.1.2.1 or 4.3.2.3.1. For adaptive equipment, the measurement duration shall be long enough to ensure a minimum number of bursts (at least 10) are captured.
NOTE 1: For adaptive equipment, to increase the measurement accuracy, a higher number of bursts may be used.

Step 2:
• For conducted measurements on devices with one transmit chain: - Connect the power sensor to the transmit port, sample the transmit signal and store the raw data.Use these stored samples in all following steps.
• For conducted measurements on devices with multiple transmit chains:
- Connect one power sensor to each transmit port for a synchronous measurement on all transmit ports.
- Trigger the power sensors so that they start sampling at the same time. Make sure the time difference between the samples of all sensors is less than half the time between two samples.

- For each instant in time, sum the power of the individual samples of all ports and store them. Use these stored samples in all following steps.

Step 3:
• Find the start and stop times of each burst in the stored measurement samples.
NOTE 2: The start and stop times are defined as the points where the power is at least 20 dB below the RMS burst power calculated in step 4.

Step 4:

• Between the start and stop times of each individual burst calculate the RMS power over the burst. Save these Pburst values, as well as the start and stop times for each burst.

Step 5:

• The highest of all Pburst values (value "A" in dBm) will be used for maximum e.i.r.p. calculations.

Step 6:

• Add the (stated) antenna assembly gain "G" in dBi of the individual antenna.

• If applicable, add the additional beamforming gain "Y" in dB.

•If more than one antenna assembly is intended for this power setting, the maximum overall antenna gain (G or G + Y) shall be used.

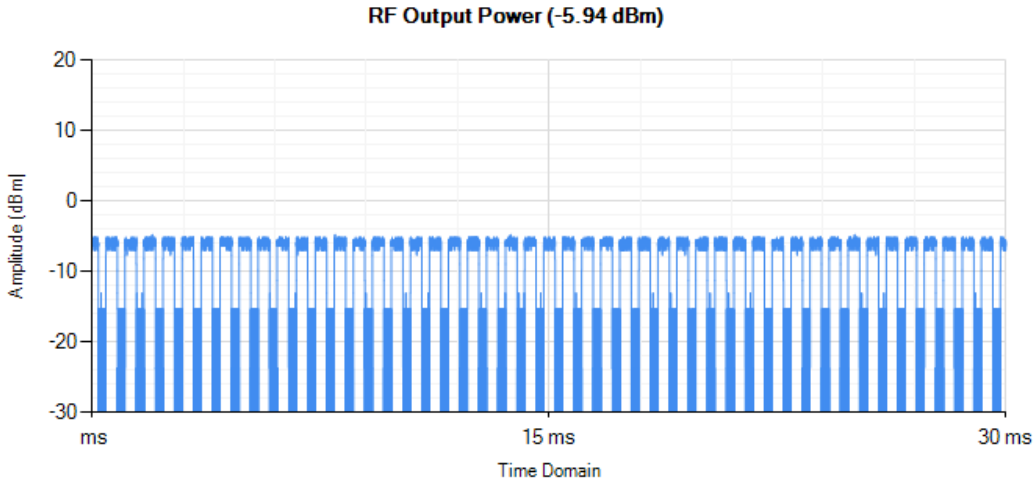
• The RF Output Power (P) shall be calculated using the formula below: P = A + G + Y

• This value, which shall comply with the limit given in clauses 4.3.1.1.2 or 4.3.2.1.2, shall be recorded in the test report.

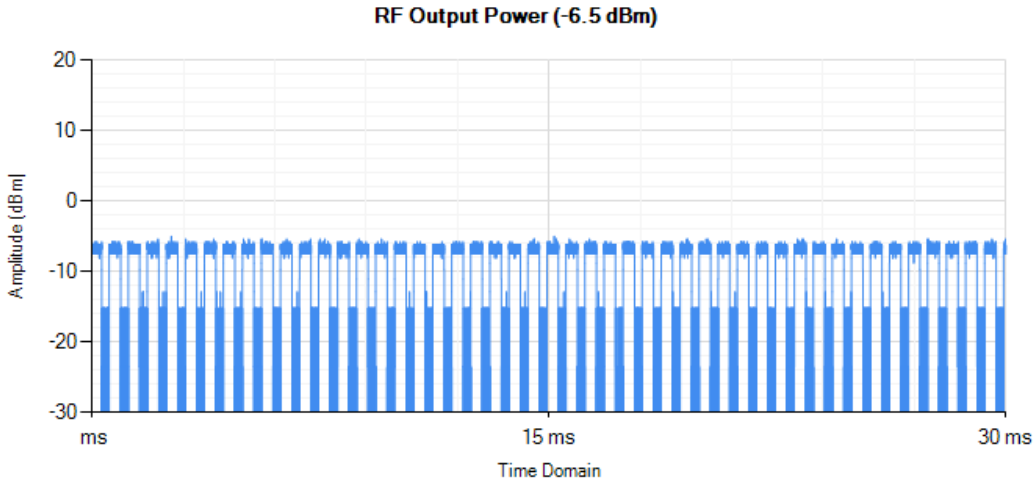
3.3 Summary of Test Results

Test Conditions	EIRP (dBm)			Limit
	Lowest CH	Middle CH	Highest CH	dBm
BLE mode				
Normal	-5.94	-6.50	-6.23	20
LTLV	-5.89	-6.47	-6.21	20
LTHV	-5.91	-6.48	-6.17	20
HTHV	-5.85	-6.41	-6.21	20
HTLV	-5.90	-6.40	-6.15	20

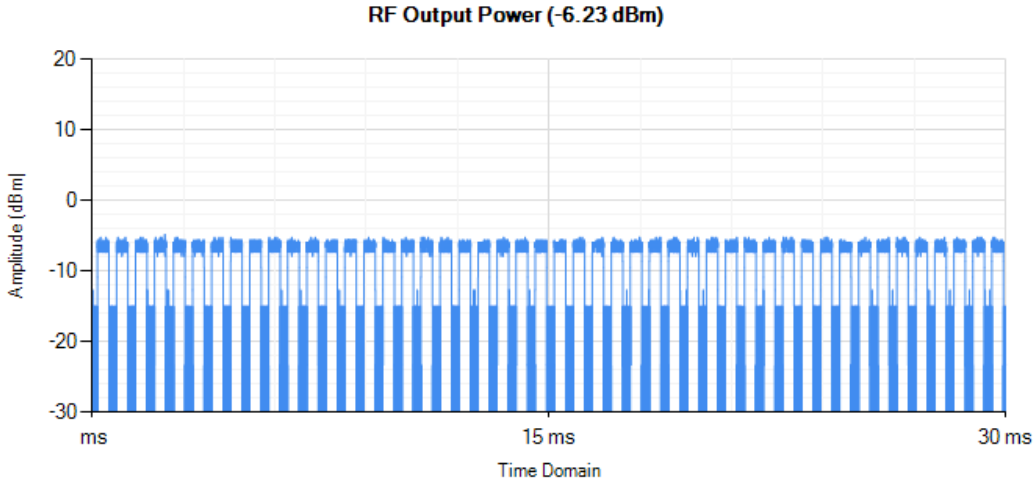
BLE Lowest Channel



BLE Middle Channel



BLE Highest Channel



4. Power Spectral Density

4.1 Standard Applicable

According to Section 4.3.2.3.3, For equipment using wide band modulations other than FHSS, the maximum Power Spectral Density is limited to10 dBm per MHz.

4.2 Test Procedure

The transmitter shall be connected to a spectrum analyser and the Power Spectral Density as defined in clause 4.3.2.3 shall be measured and recorded. The test procedure shall be as follows:

Step 1:
Connect the UUT to the spectrum analyser and use the following settings:

- Start Frequency: 2 400 MHz
- Stop Frequency: 2 483,5 MHz
- Resolution BW: 10 kHz
- Video BW: 30 kHz
- Sweep Points: > 8 350

NOTE: For spectrum analysers not supporting this number of sweep points, the frequency band may be segmented.

- Detector: RMS
- Trace Mode: Max Hold
- Sweep time: 10 s; the sweep time may be increased further until a value where the sweep time has no impact on the RMS value of the signal

For non-continuous signals, wait for the trace to be completed. Save the (trace) data set to a file.

Step 2:
For conducted measurements on smart antenna systems using either operating mode 2 or 3 (see clause 5.1.3.2), repeat the measurement for each of the transmit ports. For each frequency point, add up the amplitude (power) values for the different transmit chains and use this as the new data set.

Step 3:
Add up the values for amplitude (power) for all the samples in the file.

Step 4:
Normalize the individual values for amplitude so that the sum is equal to the RF Output Power (e.i.r.p.) measured in clause 5.3.2.

Step 5:
Starting from the first sample in the file (lowest frequency), add up the power of the following samples representing a 1 MHz segment and record the results for power and position (i.e. sample #1 to #100). This is the Power Spectral Density (e.i.r.p.) for the first 1 MHz segment which shall be recorded.

Step 6:
Shift the start point of the samples added up in step 5 by 1 sample and repeat the procedure in step 5 (i.e. sample #2 to#101).

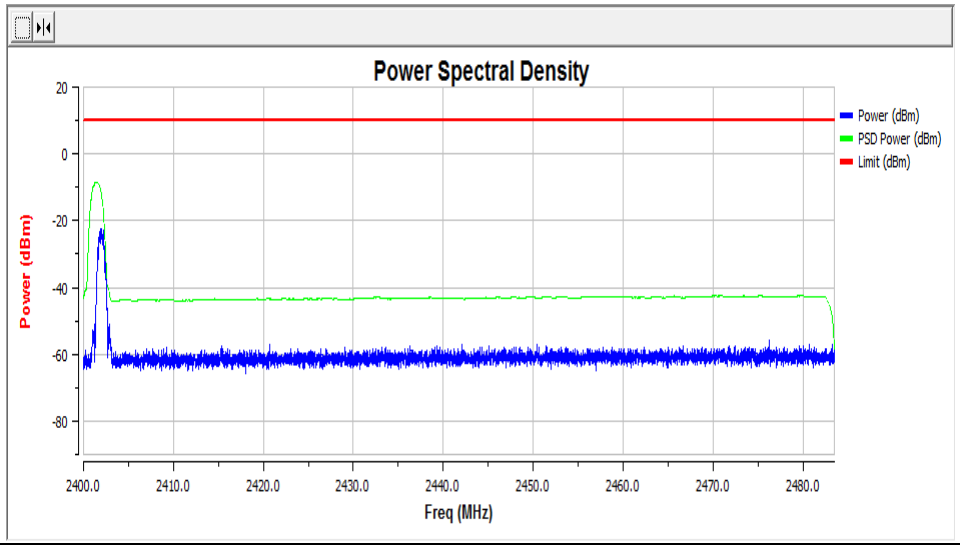
Step 7:
Repeat step 6 until the end of the data set and record the radiated Power Spectral Density values for each of the 1 MHz segments.
From all the recorded results, the highest value is the maximum Power Spectral Density for the UUT. This value, which shall comply with the limit given in clause 4.3.2.3.3, shall be recorded in the test report.

RBW=10kHz VBW=30kHz

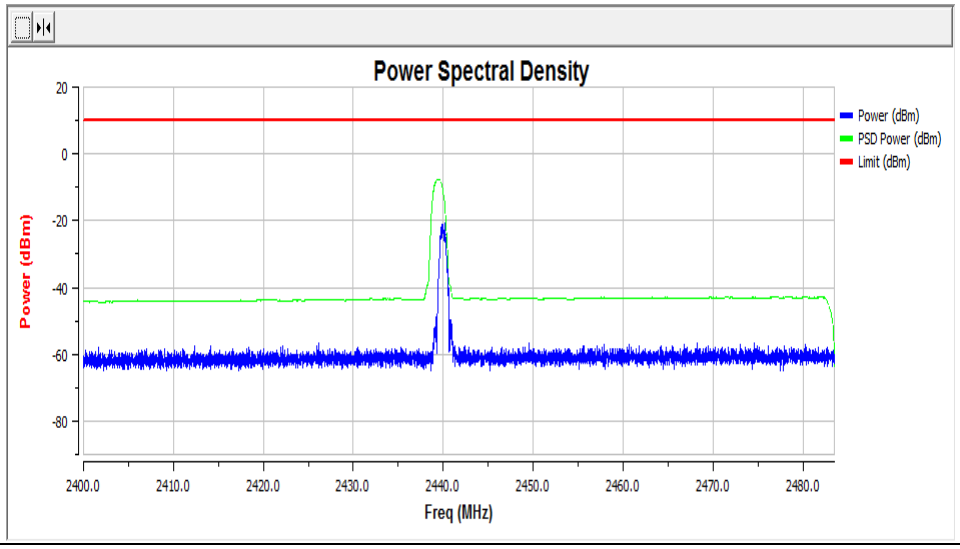
4.3 Summary of Test Results

Test Mode	Test Frequency	Spectral Density	Limit
	MHz	dBm/MHz	dBm/MHz
BLE	2402	-8.40	<10
	2440	-7.54	<10
	2480	-7.35	<10

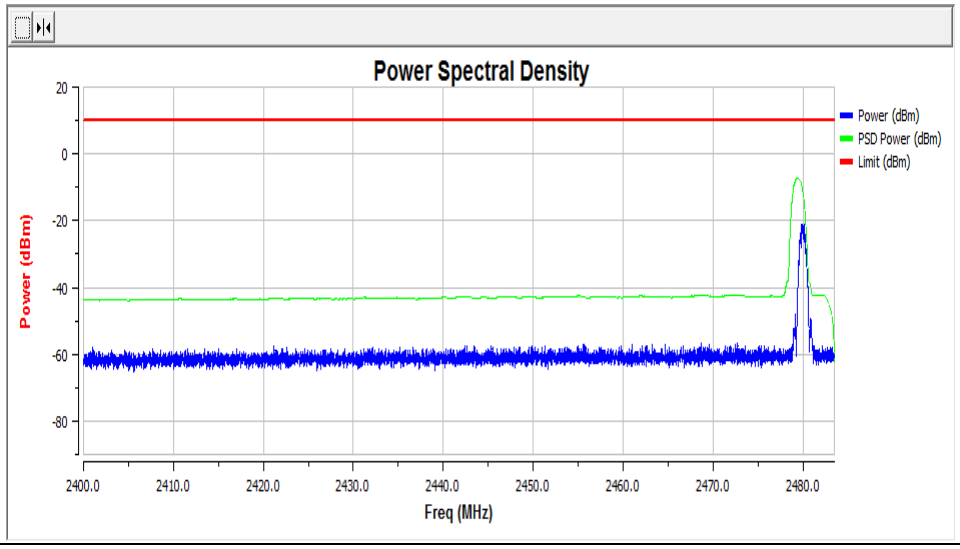
BLE Lowest Channel



BLE Middle Channel



BLE Highest Channel



5. Occupied Channel Bandwidth

5.1 Standard Application

According to section 4.3.1.7.2. The Occupied Channel Bandwidth for each hopping frequency shall fall completely within the band given in clause 1. For non-adaptive Frequency Hopping equipment with e.i.r.p greater than 10 dBm, the Occupied Channel Bandwidth for every occupied hopping frequency shall be equal to or less than the value declared by the supplier. This declared value shall not be greater than 5 MHz.

According to section 4.3.2.6.2. The Occupied Channel Bandwidth shall fall completely within the band given in clause 1. In addition, for non-adaptive systems using wide band modulations other than FHSS and with e.i.r.p greater than 10 dBm, the occupied channel bandwidth shall be less than 20 MHz.

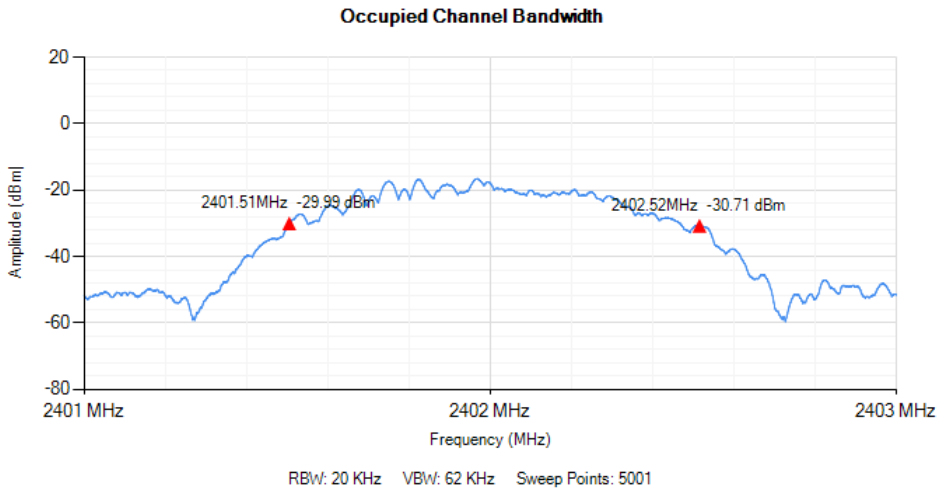
5.2 Test procedure

According to the section 5.3.5.2.1, the measurement procedure shall be as follows:
Step 1:
Connect the UUT to the spectrum analyser and use the following settings:
• Centre Frequency: The centre frequency of the channel under test
• Resolution BW: ~ 1 % of the span without going below 1 %
• Video BW: 3 × RBW
• Frequency Span: 2 × Occupied Channel Bandwidth
• Detector Mode: RMS
• Trace Mode: Max Hold
Step 2:
Wait until the trace is completed.
Find the peak value of the trace and place the analyser marker on this peak.
Step 3:
Use the 99 % bandwidth function of the spectrum analyser to measure the Occupied Channel Bandwidth of the UUT. This value shall be recorded.

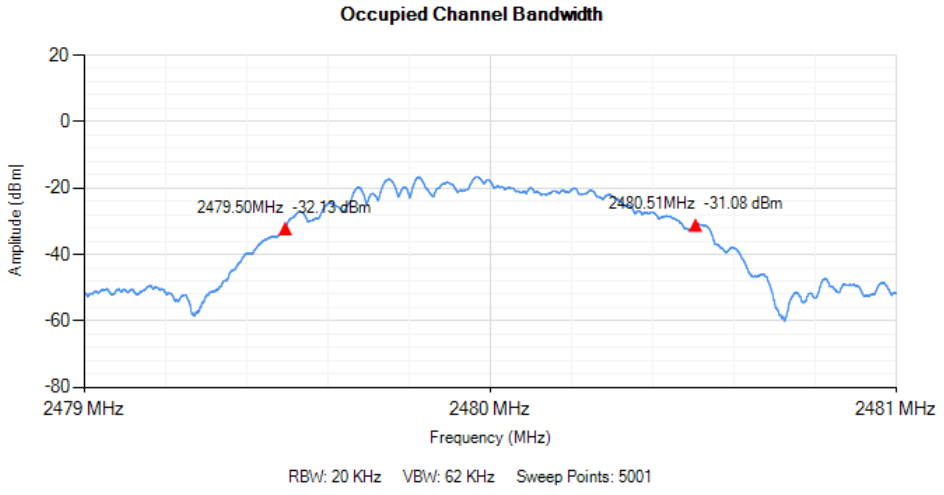
5.3 Summary of Test Results/Plots

Test Mode	Test Channel	Measured Value
	MHz	MHz
BLE	2402	1.01
	2480	1.01

BLE Lowest Channel



BLE Highest Channel



6. Transmitter Unwanted Emissions in the Out-of-band Domain

6.1 Standard Application

According to section 4.3.1.8.2 and 4.3.2.7.2. The transmitter unwanted emissions in the out-of-band domain but outside the allocated band, shall not exceed the values provided by the mask in figure 1.

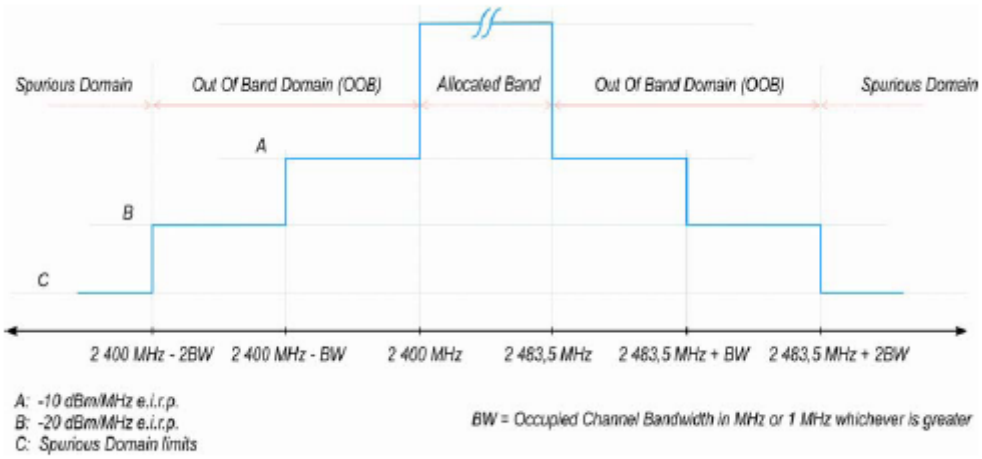


Figure 1: Transmit mask

6.2 Test procedure

According to the section 5.3.9.2.1, the measurement procedure shall be as follows:
The Out-of-band emissions within the different horizontal segments of the mask provided in figures 1 and 3 shall be measured using the steps below. This method assumes the spectrum analyser is equipped with the Time Domain Poweroption.

Step 1:
• Connect the UUT to the spectrum analyser and use the following settings:
- Centre Frequency: 2 484 MHz
- Span: 0 Hz
- Resolution BW: 1 MHz
- Filter mode: Channel filter
- Video BW: 3 MHz
- Detector Mode: RMS
- Trace Mode: Clear / Write
- Sweep Mode: Continuous
- Sweep Points: 5 000
- Trigger Mode: Video trigger
- Sweep Time: Suitable to capture one transmission burst

Step 2: (segment 2 483,5 MHz to 2 483,5 MHz + BW)
• Adjust the trigger level to select the transmissions with the highest power level.

• For frequency hopping equipment operating in a normal hopping mode, the different hops will result in signal bursts with different power levels. In this case the burst with the highest power level shall be selected.
• Set a window (start and stop lines) to match with the start and end of the burst and in which the RMS power shall be measured using the Time Domain Power function.
• Select RMS power to be measured within the selected window and note the result which is the RMS power within this 1 MHz segment (2 483,5 MHz to 2 484,5 MHz). Compare this value with the applicable limit provided by the mask.
• Increase the centre frequency in steps of 1 MHz and repeat this measurement for every 1 MHz segment within the range 2 483,5 MHz to 2 483,5 MHz + BW. The centre frequency of the last 1 MHz segment shall be set to 2 483,5 MHz + BW - 0,5 MHz (which means this may partly overlap with the previous 1 MHz segment).

Step 3: (segment 2 483,5 MHz + BW to 2 483,5 MHz + 2BW)
• Change the centre frequency of the analyser to 2 484 MHz + BW and perform the measurement for the first 1 MHz segment within range 2 483,5 MHz + BW to 2 483,5 MHz + 2BW. Increase the centre frequency in 1 MHz steps and repeat the measurements to cover this whole range. The centre frequency of the last 1 MHz segment shall be set to 2 483,5 MHz + 2 BW - 0,5 MHz.

Step 4: (segment 2 400 MHz - BW to 2 400 MHz)
• Change the centre frequency of the analyser to 2 399,5 MHz and perform the measurement for the first 1 MHz segment within range 2 400 MHz - BW to 2 400 MHz Reduce the centre frequency in 1 MHz steps and repeat the measurements to cover this whole range. The centre frequency of the last 1 MHz segment shall be set to 2 400 MHz - 2BW + 0,5 MHz.

Step 5: (segment 2 400 MHz - 2BW to 2 400 MHz - BW)
• Change the centre frequency of the analyser to 2 399,5 MHz - BW and perform the measurement for the first 1 MHz segment within range 2 400 MHz - 2BW to 2 400 MHz - BW. Reduce the centre frequency in 1 MHz steps and repeat the measurements to cover this whole range. The centre frequency of the last 1 MHz segment shall be set to 2 400 MHz - 2BW + 0,5 MHz.

Step 6:
• In case of conducted measurements on equipment with a single transmit chain, the declared antenna assembly gain "G" in dBi shall be added to the results for each of the 1 MHz segments and compared with the limits provided by the mask given in figures 1 or 3. If more than one antenna assembly is intended for this power setting, the antenna with the highest gain shall be considered.

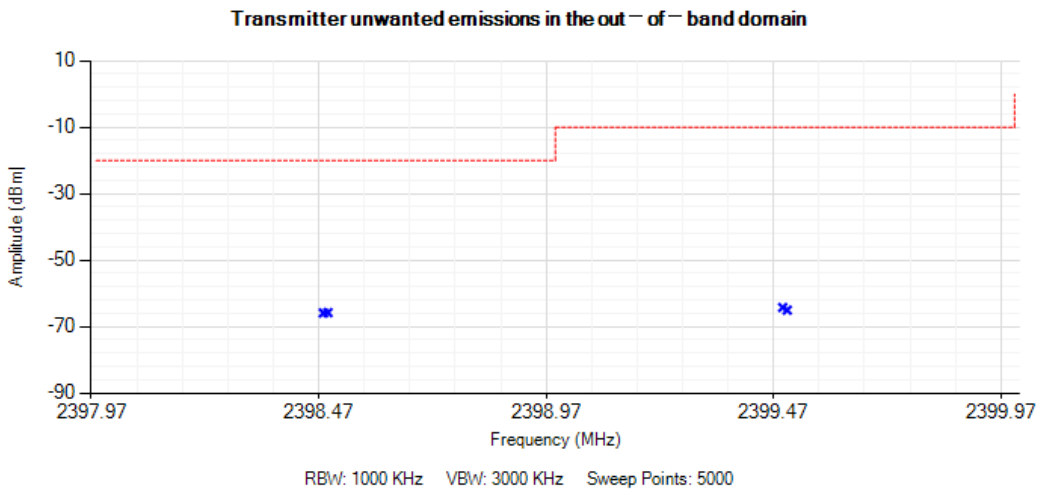
These measurements have to be performed at normal environmental conditions and shall be repeated at the extremes of the operating temperature range.

RBW=1MHz VBW=3MHz

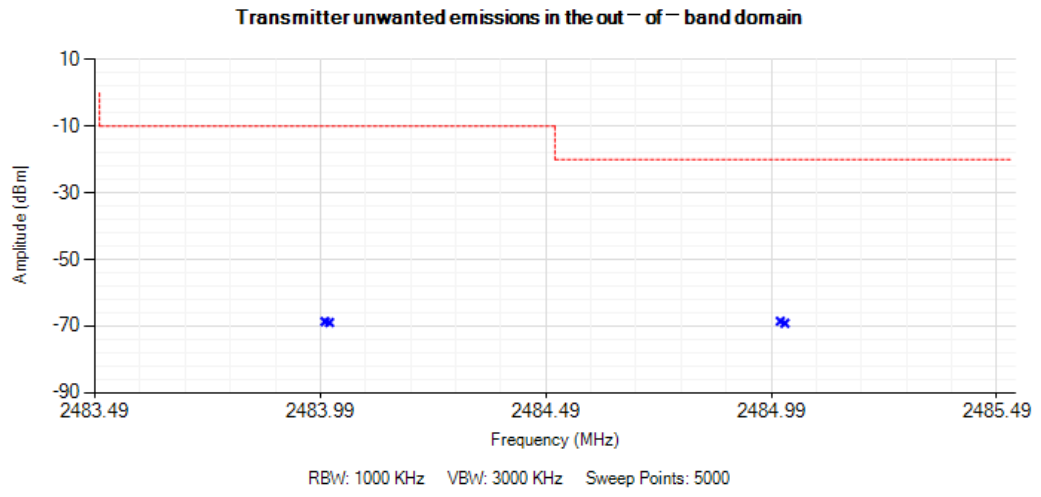
6.3 Summary of Test Results/Plots

Test Band.	Test Segment MHz	Max. Emissions Reading (dBm) Normal	LTLV	LTHV	HTHV	HTLV	Limit dBm
Test Mode: BLE							
Lowest	2400-BW to 2400	-64.24	-64.21	-64.20	-64.21	-64.20	-10
	2400-2BW to 2400-BW	-65.78	-65.78	-65.78	-65.78	-65.78	-20
Highest	2483.5 to 2483.5+BW	-66.29	-66.20	-66.21	-66.23	-66.29	-10
	2483.5+BW to 2483.5+2BW	-66.09	-66.03	-66.05	-66.0	-66.04	-20
Note 1: BW please refer to section 7.3 Note 2: the data just list the worst cases							

BLE Lowest Channel



BLE Highest Channel



7. Transmitter Unwanted Emissions in the Spurious Domain

7.1 Standard Applicable

According to section 4.3.1.9.2 and 4.3.2.8.2. The transmitter unwanted emissions in the spurious domain shall not exceed the values given in the following table.

Transmitter limit for spurious emissions

Frequency range	Maximum power, e.r.p. (≤ 1 GHz) e.i.r.p. (> 1 GHz)	Bandwidth
30 MHz to 47 MHz	-36 dBm	100 kHz
47 MHz to 74 MHz	-54 dBm	100 kHz
74 MHz to 87,5 MHz	-36 dBm	100 kHz
87,5 MHz to 118 MHz	-54 dBm	100 kHz
118 MHz to 174 MHz	-36 dBm	100 kHz
174 MHz to 230 MHz	-54 dBm	100 kHz
230 MHz to 470 MHz	-36 dBm	100 kHz
470 MHz to 862 MHz	-54 dBm	100 kHz
862 MHz to 1 GHz	-36 dBm	100 kHz
1 GHz to 12,75 GHz	-30 dBm	1 MHz

7.2 Test Procedure

The device under test has an integral antenna and the radiated measurement shall apply to the device, using the method of measurement as described in the EN300328 section 5.3.10.2.

RBW=100kHz VBW=300kHz 30MHz-1GHz
RBW=1MHz VBW=3MHz 1GHz-12.75GHz

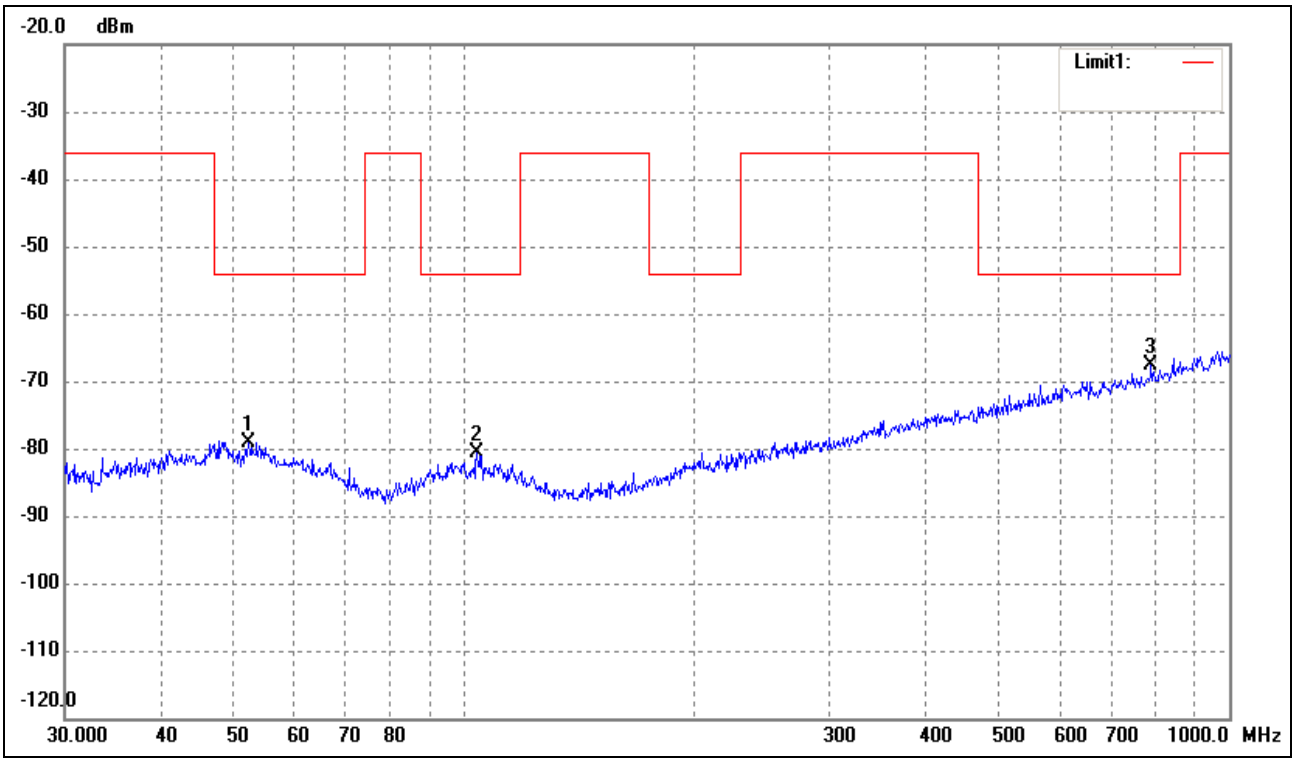
7.3 Summary of Test Results/Plots

According to the data, the EUT complied with the EN 300328 standards, and had the worst cases:

Spurious Emission from 30MHz to 1GHz

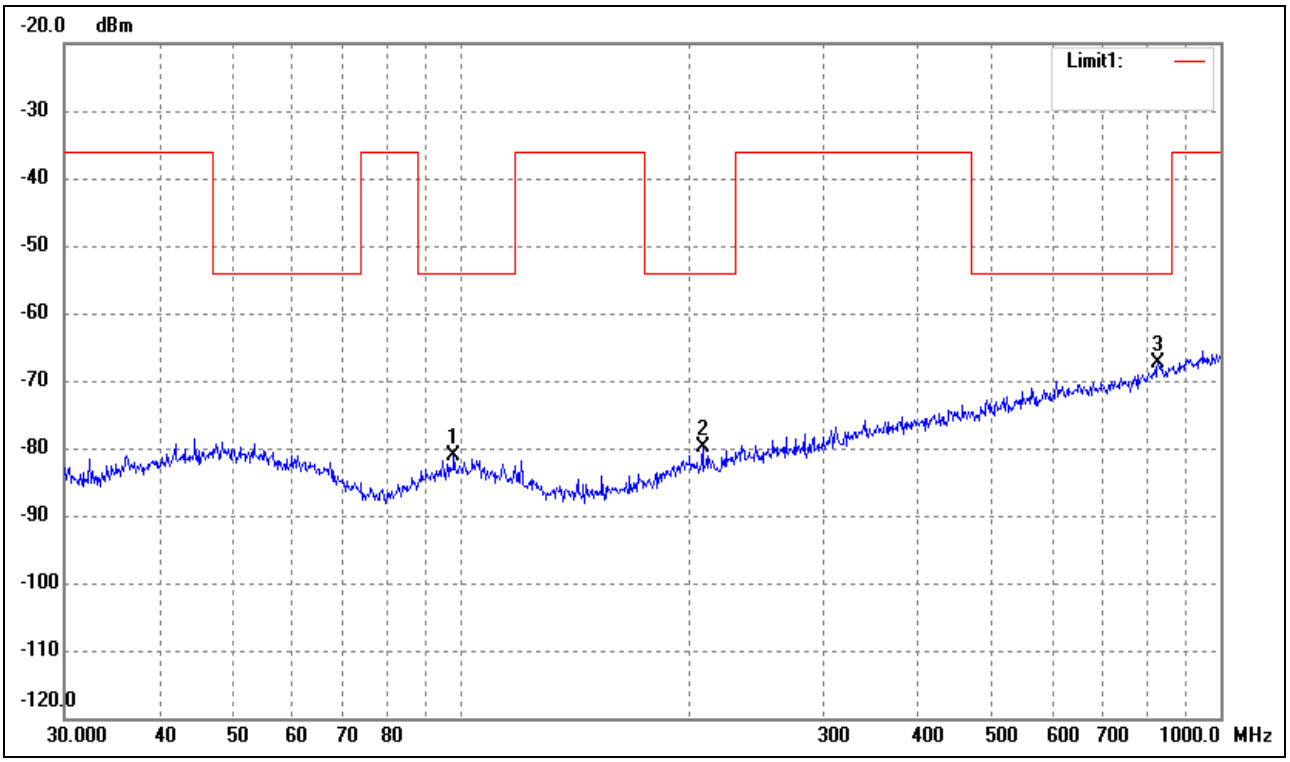
Test Mode: Transmitting-Lowest channel

Horizontal:



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	
1	52.2079	-83.23	4.14	-79.09	-54.00	-25.09	ERP
2	103.8055	-82.81	2.23	-80.58	-54.00	-26.58	ERP
3*	790.6188	-81.74	14.21	-67.53	-54.00	-13.53	ERP

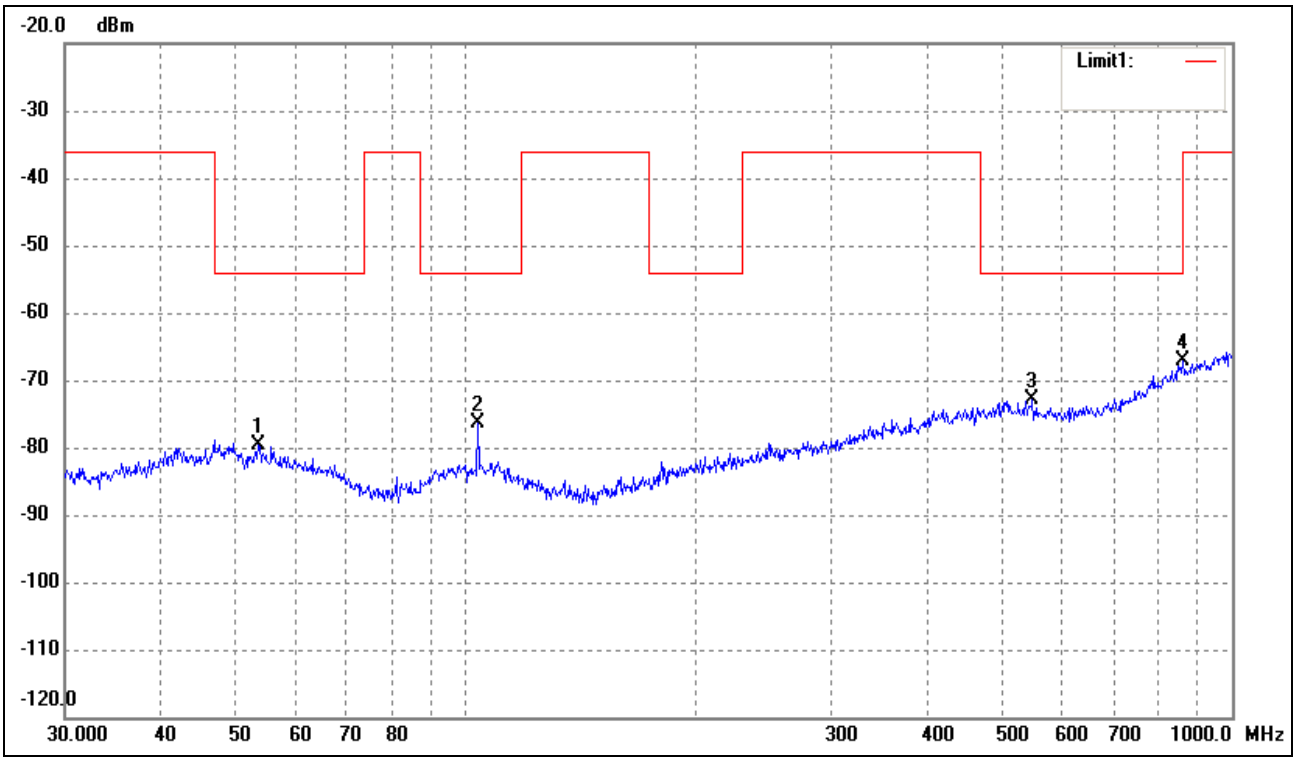
Vertical:



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	
1	97.7983	-83.16	1.98	-81.18	-54.00	-27.18	ERP
2	207.8501	-82.70	2.80	-79.90	-54.00	-25.90	ERP
3*	827.4934	-83.24	15.89	-67.35	-54.00	-13.35	ERP

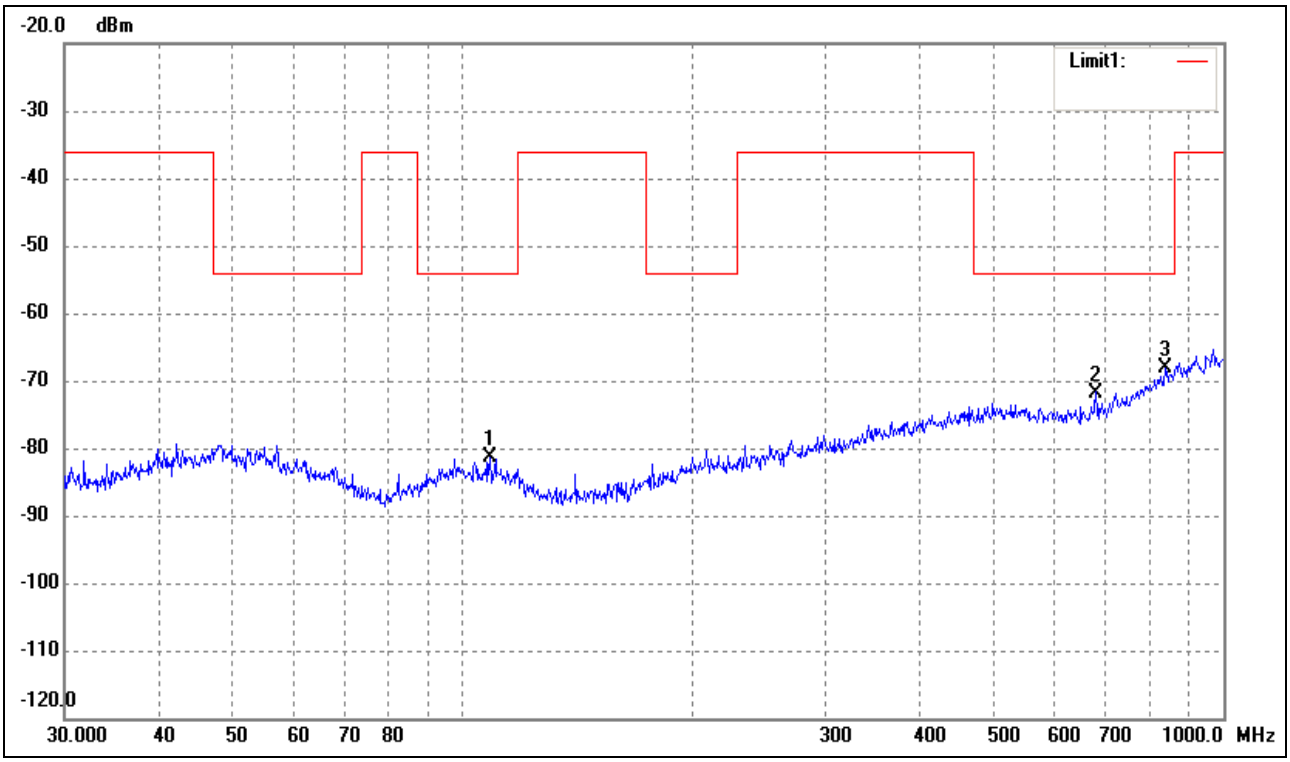
Test Mode: Transmitting-Highest channel

Horizontal:



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	
1	53.6932	-83.72	3.98	-79.74	-54.00	-25.74	ERP
2	103.8055	-78.61	2.23	-76.38	-54.00	-22.38	ERP
3*	549.0195	-83.27	10.44	-72.83	-54.00	-18.83	ERP
4	863.0562	-83.27	16.08	-67.19	-36.00	-31.19	ERP

Vertical:



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	
1	108.6470	-83.56	2.20	-81.36	-54.00	-27.36	ERP
2	679.9600	-85.60	13.85	-71.75	-54.00	-17.75	ERP
3*	839.1818	-84.23	16.05	-68.18	-54.00	-14.18	ERP

Spurious Emission above 1GHz

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Lowest Channel-2402MHz						
4804	-66.54	14.55	-51.99	-30	-21.99	H
7206	-68.87	17.64	-51.23	-30	-21.23	H
4804	-67.19	14.55	-52.64	-30	-22.64	V
7206	-67.66	17.64	-50.02	-30	-20.02	V
Highest Channel-2480MHz						
4960	-69.86	18.35	-51.51	-30	-21.51	H
7440	-66.33	13.97	-52.36	-30	-22.36	H
4960	-58.65	8.35	-50.3	-30	-20.30	V
7440	-62.13	12.78	-49.35	-30	-19.35	V

Note 1: Testing is carried out with frequency rang 30MHz to 12.75GHz, which above 4th Harmonics are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

Note 2: this EUT was tested in 3 orthogonal positions and the worst case position data was reported.

8. Receiver Spurious Emissions

8.1 Standard Applicable

According to section 4.3.1.10.2 and 4.3.2.9.2, The spurious emissions of the receiver shall not exceed the values given in the following table .

Spurious emission limits for receivers

Frequency range	Maximum power e.r.p. (≤ 1 GHz) e.i.r.p. (> 1 GHz)	Measurement bandwidth
30 MHz to 1 GHz	-57 dBm	100 kHz
1 GHz to 12,75 GHz	-47 dBm	1 MHz

8.2 Test Procedure

The device under test has an integral antenna and the radiated measurement shall apply to the device, using the method of measurement as described in the EN300328 section 5.3.11.2.

RBW=100kHz VBW=300kHz 30MHz-1GHz
RBW=1MHz VBW=3MHz 1GHz-12.75GHz

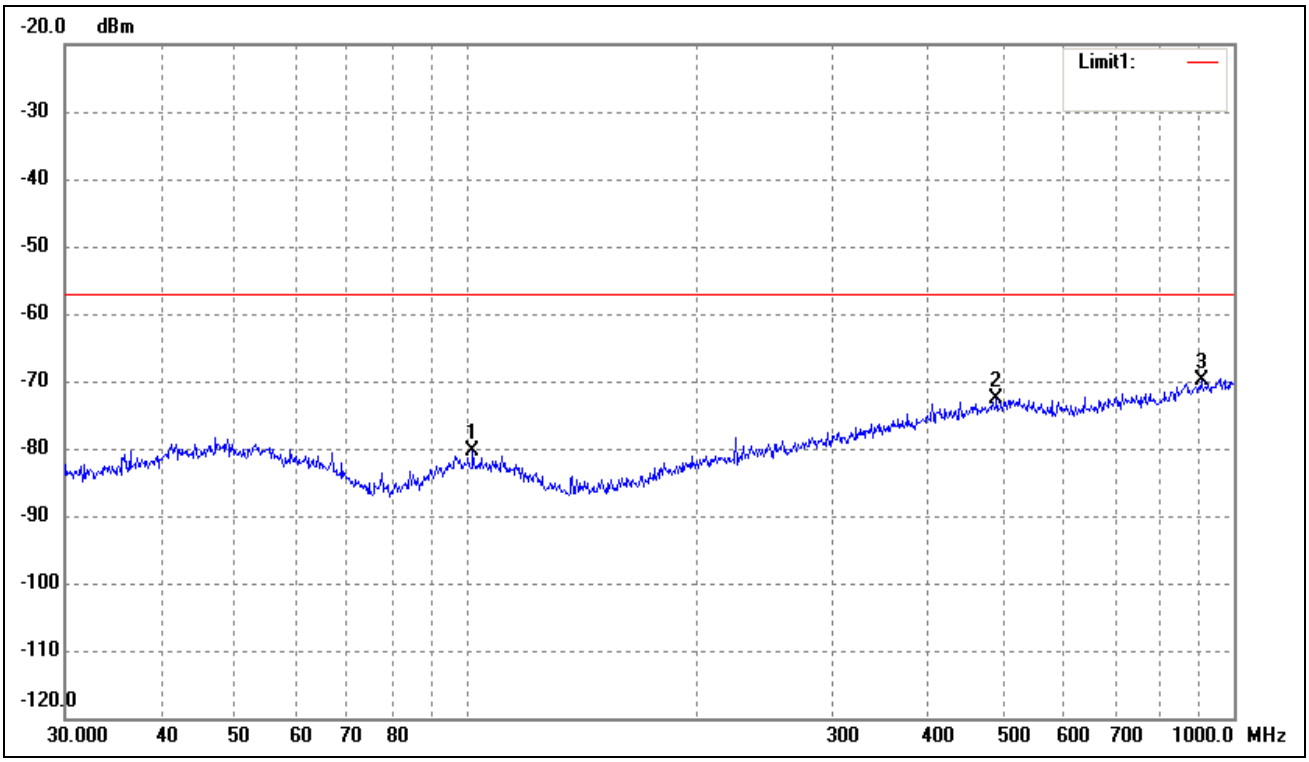
8.3 Summary of Test Results/Plots

According to the data, the EUT complied with the EN 300328 standards, and had the worst case:

The worst case is DH5

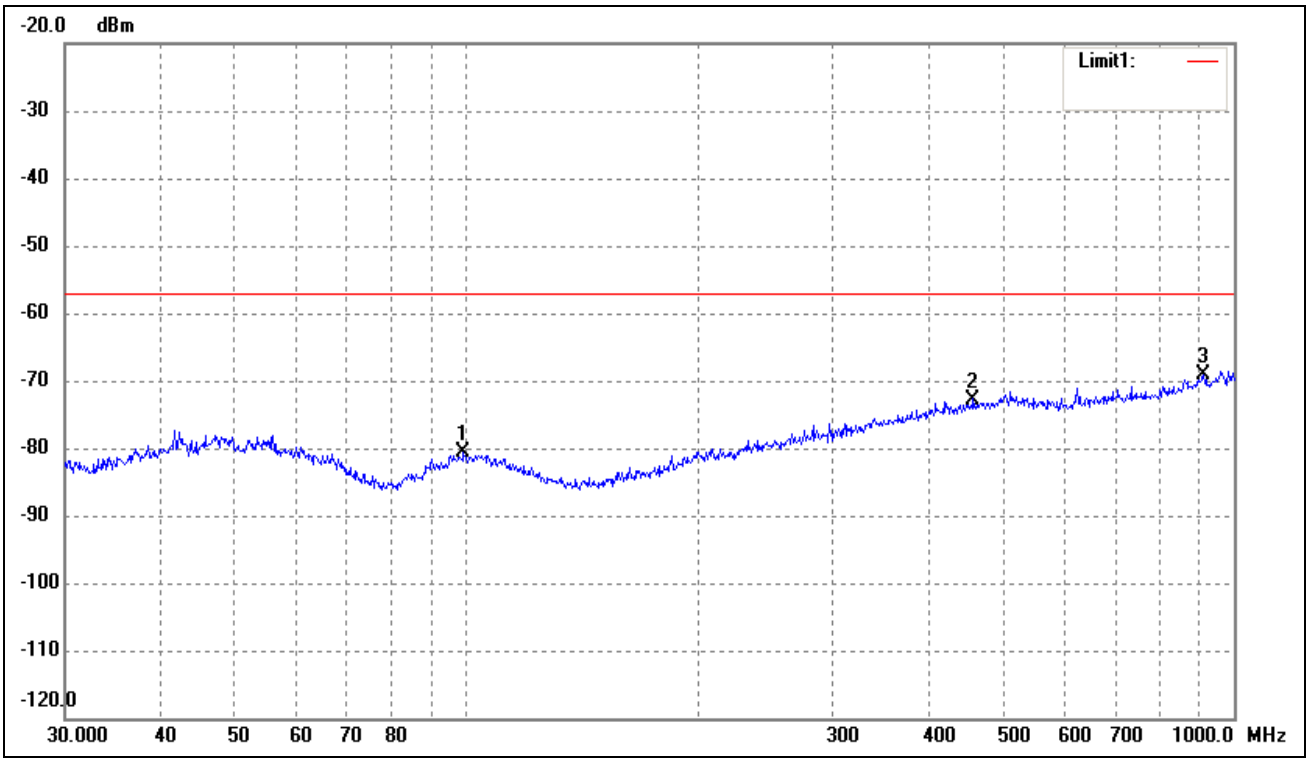
Test Mode: Receiving

Horizontal:



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	
1	102.0014	-82.67	2.23	-80.44	-57.00	-23.44	ERP
2	490.7447	-83.17	10.47	-72.70	-57.00	-15.70	ERP
3	906.4824	-83.30	13.39	-69.91	-57.00	-12.91	ERP

Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	
1	99.1797	-70.87	-9.66	-80.53	-57.00	-23.53	ERP
2	457.5073	-70.67	-2.08	-72.75	-57.00	-15.75	ERP
3	912.8620	-74.62	5.53	-69.09	-57.00	-12.09	ERP

Note: Testing is carried out with frequency rang 30MHz to 12.75GHz, which above 1GHz are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

Annex A. EUT Photos

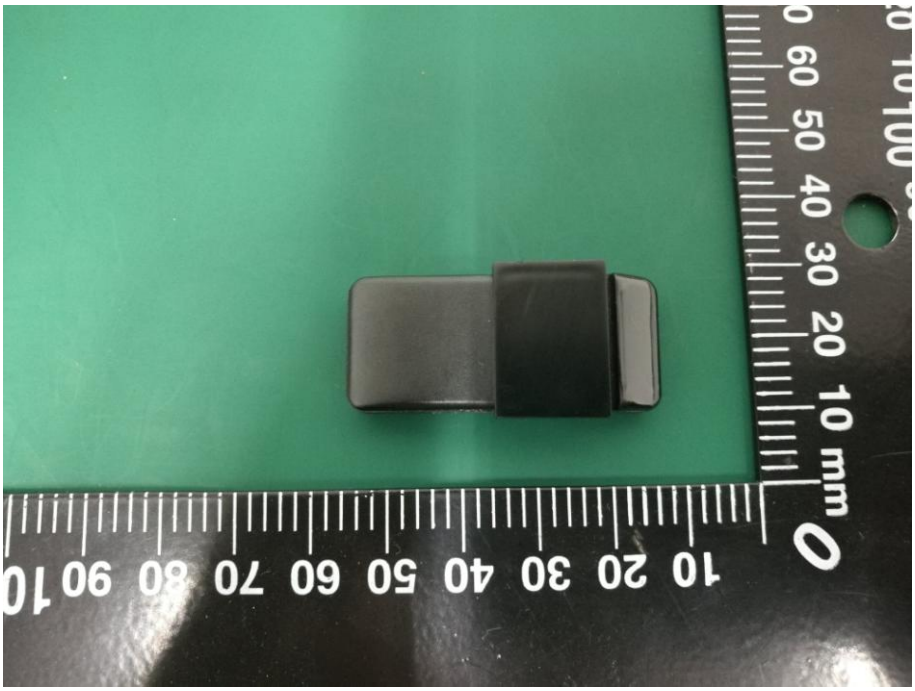
EUT View 1

EUT View 2

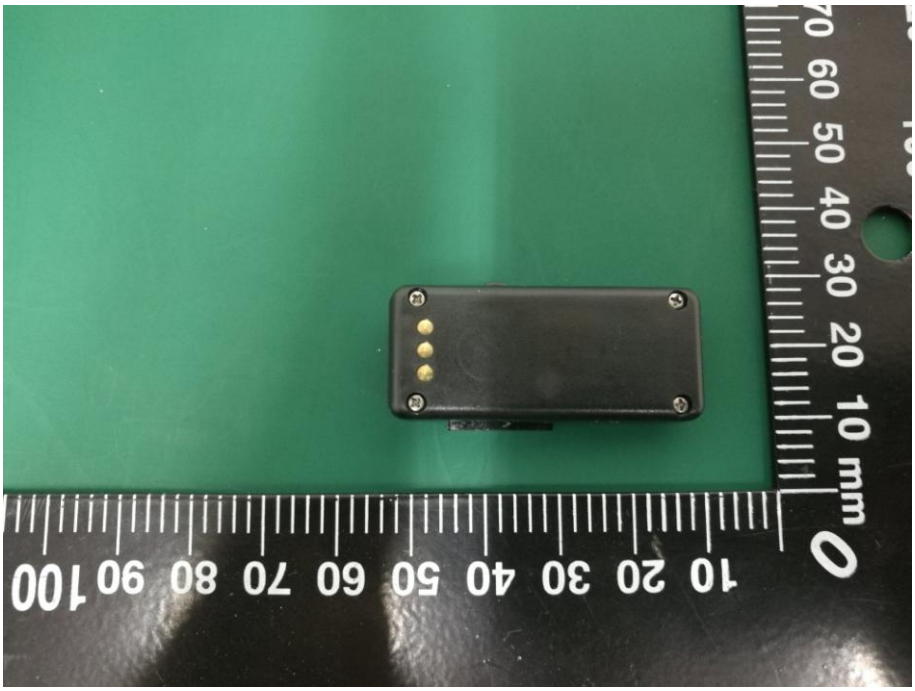
EUT View 3

EUT View 4

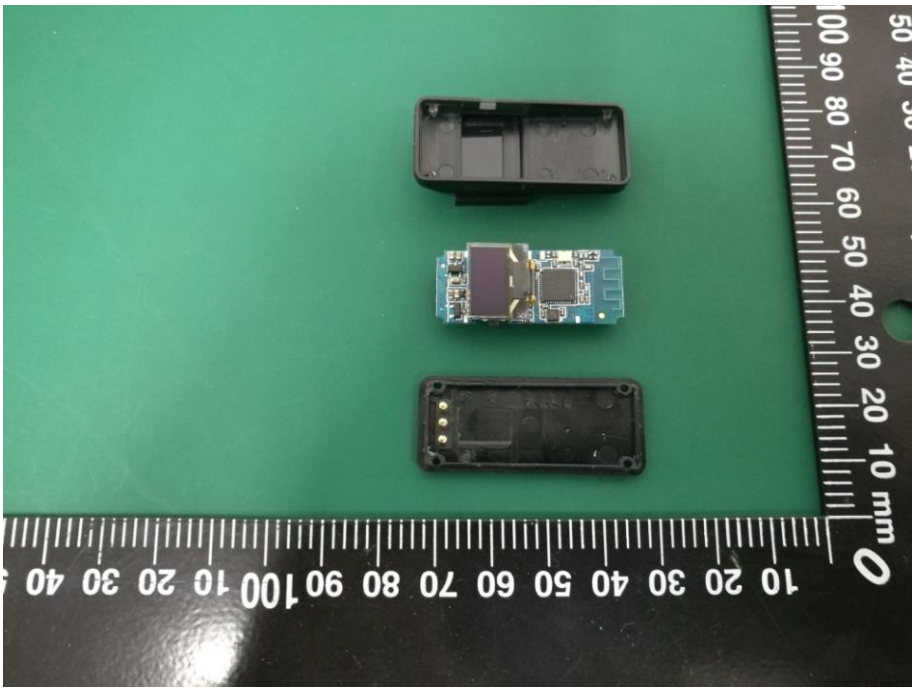
EUT View 5



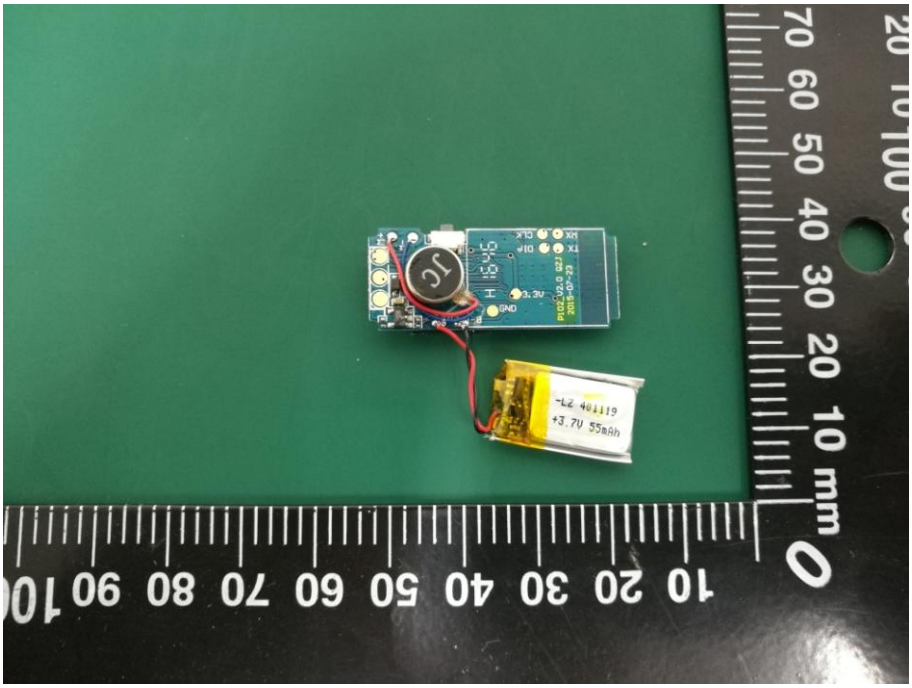
EUT View 6



EUT View 7



EUT View 8



Annex B. Label and Information

CE Mark Sample

CE Mark Specifications

Text is Black in color and is justified. Labels are printed in indelible ink on permanent adhesive backing or silk-screened onto the EUT or shall be affixed at a conspicuous location on the EUT. The ‘CE’ marking must be affixed to the EUT or to its data plate. Where this is not possible or not warranted on account of the nature of the apparatus, it must be affixed to the packaging, if any, and to the accompanying documents. The ‘CE’ marking must have a height of at least 5 mm. If the ‘CE’ marking is reduced or enlarged the proportions given in the above graduated drawing must be respected.

******* END OF REPORT *******