Test Report

No.SZR170210006001 Date: Feb. 28, 2017

Applicant : GUANGZHOU HC INFORMATION TECHNOLOGY CO.LTD

Address : ROOM 608 NUM.19 JIANGONG ROAD TIANHE SOFTWARE PARK TIANHE DISTRICT GUANGZHOU

The submitted sample and sample information was/were submitted and identified by/on the behalf of the client

Sample name : Bluetooth Module

Type /model : HC-05, HC-06

Item No/ Lot No. : 1701

Material : Electronic material

Manufacturer : GUANGZHOU HC INFORMATION TECHNOLOGY CO.LTD

Sample received date : Feb. 10, 2017

Testing period : Feb. 10, 2017 to Feb. 28, 2017

Test requested :

1. According to the RoHS Directive 2011/65/EU and amendment Commission Delegated Directive (EU) 2015/863 with effective from 22 July 2019:

(1). As specified by client, to screen Lead(Pb), Cadmium(Cd), Mercury(Hg), Chromium(Cr) and Bromine(Br) in the submitted sample(s) by XRF.

(2). As specified by client, when screening results exceed the XRF screening limit in IEC 62321-3-1:2013, further use of chemical methods are required to test the Lead(Pb), Cadmium(Cd), Mercury(Hg), Hexavalent Chromium(Cr(VI)), Polybrominated Biphenyls(PBBs), Polybrominated Diphenyl Ethers(PBDEs) in the submitted samples.

(3). As specified by client, to test the Dibutyl phthalate(DBP), Di-2-ethylhexyl phthalate(DEHP), Di-isobutyl phthalate(DIBP), Benzyl butyl phthalate(BBP) in the submitted sample.

2. As specified by client, to test the Hexabromocyclododecane (HBCDD) in the submitted sample.

Test Method: Please refer to the following page(s).

Test Result(s): Please refer to the following page(s).

Tested by _____ Inspected by _____ Approved by _____

Test Report

1.

Test Method:

A. Screening test by XRF spectroscopy

XRF screening limits in mg/kg for regulated elements according to IEC 62321-3-1:2013.

Element	Limit of IEC 62321-3-1:2013. Unit (mg/kg)		MDL	
	Polymers and metals	Composite material	Polymers	Other material
Pb	BL≤(700-3σ) <X <(1300+3σ) ≤OL	BL≤(500-3σ)<X <(1500+3σ) ≤OL	10 mg/kg	50 mg/kg
Cd	BL≤(70-3σ)<X <(130+3σ) ≤OL	LOD≤(50-3σ)<X <(150+3σ) ≤OL	10 mg/kg	50 mg/kg
Hg	BL≤(700-3σ)<X <(1300+3σ) ≤OL	BL≤(500-3σ)<X <(1500+3σ) ≤OL	10 mg/kg	50 mg/kg
Cr	BL≤(700-3σ)< X	BL≤(500-3σ)< X	10 mg/kg	50 mg/kg
Br	BL≤(300-3σ)< X	BL≤(250-3σ)< X	10 mg/kg	50 mg/kg

Note:

-BL = Under the XRF screening limit

-OL = Further chemical test will be conducted while result is above the screening limit

-X= The symbol “X” marks the region where further investigation is necessary

-3 σ = The reproducibility of analytical instruments

-LOD= Detection limit

B. Chemical Test

Test Item(s)	Test Method	Measured Equipment(s)	MDL	Limit
Lead (Pb)	IEC 62321-5:2013 Ed.1.0	ICP-OES	2 mg/kg	1000 mg/kg
Cadmium (Cd)	IEC 62321-5:2013 Ed.1.0	ICP-OES	2 mg/kg	100 mg/kg
Mercury (Hg)	IEC 62321-4:2013 Ed.1.0	ICP-OES	2 mg/kg	1000 mg/kg
Hexavalent Chromium Cr(VI)	IEC 62321-7-1:2015 Ed.1.0	UV-VIS	/	1000 mg/kg
	IEC 62321:2008 Ed.1 Annex C	UV-VIS	2 mg/kg	1000 mg/kg
Polybrominated Biphenyls (PBBs)	IEC 62321-6:2015 Ed.1.0	GC-MS	5 mg/kg	1000 mg/kg
Polybrominated Diphenyl Ethers (PBDEs)	IEC 62321-6:2015 Ed.1.0	GC-MS	5 mg/kg	1000 mg/kg
Phthalates	EN 14372:2004(E)	GC-MS	50 mg/kg	1000 mg/kg

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Test Results:

Sample No.	Sample Description	Tested Items	XRF Screening Test Unit (mg/kg)	Chemical Test Unit (mg/kg)	Conclusion
1	Chip capacitor	Pb	BL	/	PASS
		Cd	LOD	/	
		Hg	BL	/	
		Cr(Cr(VI))	BL	/	
		Br(PBBs&PBDEs)	BL	/	
2	Chip resistor	Pb	BL	/	PASS
		Cd	LOD	/	
		Hg	BL	/	
		Cr(Cr(VI))	BL	/	
		Br(PBBs&PBDEs)	BL	/	
3	IC	Pb	BL	/	PASS
		Cd	LOD	/	
		Hg	BL	/	
		Cr(Cr(VI))	BL	/	
		Br(PBBs&PBDEs)	BL	/	
4	Chip inductor	Pb	BL	/	PASS
		Cd	LOD	/	
		Hg	BL	/	
		Cr(Cr(VI))	BL	/	
		Br(PBBs&PBDEs)	BL	/	
5	Chip LED	Pb	BL	/	PASS
		Cd	LOD	/	
		Hg	BL	/	
		Cr(Cr(VI))	BL	/	
		Br(PBBs&PBDEs)	BL	/	
6	Crystal oscillator	Pb	BL	/	PASS
		Cd	BL	/	
		Hg	BL	/	
		Cr(Cr(VI))	BL	/	
		Br(PBBs&PBDEs)	/	/	

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Sample No.	Sample Description	Tested Items	XRF Screening Test Unit (mg/kg)	Chemical Test Unit (mg/kg)	Conclusion
7	Filter	Pb	BL	/	PASS
		Cd	LOD	/	
		Hg	BL	/	
		Cr(Cr(VI))	BL	/	
		Br(PBBs&PBDEs)	BL	/	
8	PCB	Pb	BL	/	PASS
		Cd	LOD	/	
		Hg	BL	/	
		Cr(Cr(VI))	BL	/	
		Br(PBBs&PBDEs)	X	N.D.	

Note:

-MDL = Method Detection Limit

-N.D. = Not Detected (<MDL)

-mg/kg = ppm = parts per million

-Negative = Absence of Cr(VI) , the detected Cr(VI) concentration in the boiling water extraction solution is less than 0.10ug/cm^2.

-Positive = Presence of Cr(VI), the detected Cr(VI) concentration in the boiling water extraction solution is equal to or greater than 0.13ug/cm^2.

Remark:

- The screening results are only used for reference.
- When conducting the test for PBBs&PBDEs, XRF was introduced to screen Br Exclusively; When conducting the test for Hexavalent Chromium, XRF was introduced to screen Chromium exclusively.

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Test Result(s):

Tested Item(s)	Result Unit (mg/kg)			
	Sample No. 1	Sample No. 2	Sample No. 3	Sample No. 4
Di-isobutyl phthalate(DIBP) CAS #:84-69-5	N.D.	N.D.	N.D.	N.D.
Dibutyl phthalate(DBP) CAS #:84-74-2	N.D.	N.D.	N.D.	N.D.
Benzylbutyl phthalate(BBP) CAS #:85-68-7	N.D.	N.D.	N.D.	N.D.
Di-2-ethylhexyl phthalate(DEHP) CAS #:117-81-7	N.D.	N.D.	N.D.	N.D.

Tested Item(s)	Result Unit (mg/kg)		
	Sample No. 5	Sample No. 7	Sample No. 8
Di-isobutyl phthalate(DIBP) CAS #:84-69-5	N.D.	N.D.	N.D.
Dibutyl phthalate(DBP) CAS #:84-74-2	N.D.	N.D.	N.D.
Benzylbutyl phthalate(BBP) CAS #:85-68-7	N.D.	N.D.	N.D.
Di-2-ethylhexyl phthalate(DEHP) CAS #:117-81-7	N.D.	N.D.	N.D.

Note:

-MDL = Method Detection Limit

-N.D. = Not Detected (<MDL)

-mg/kg = ppm = parts per million

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2.

Test Method:

Test Item(s)	Test Method	Measured Equipment(s)
Hexabromocyclododecane (HBCDD)	US EPA 3540C:1996	GC-MS

Test Result(s):

Tested Item(s)	Result Unit (mg/kg)				MDL Unit (mg/kg)
	Sample No. 1	Sample No. 2	Sample No. 3	Sample No. 4	
Hexabromocyclododecane (HBCDD)	N.D.	N.D.	N.D.	N.D.	10

Tested Item(s)	Result Unit (mg/kg)				MDL Unit (mg/kg)
	Sample No. 5	Sample No. 6	Sample No. 7	Sample No. 8	
Hexabromocyclododecane (HBCDD)	N.D.	N.D.	N.D.	N.D.	10

Note:

-MDL = Method Detection Limit

-N.D. = Not Detected (<MDL)

-mg/kg = ppm = parts per million

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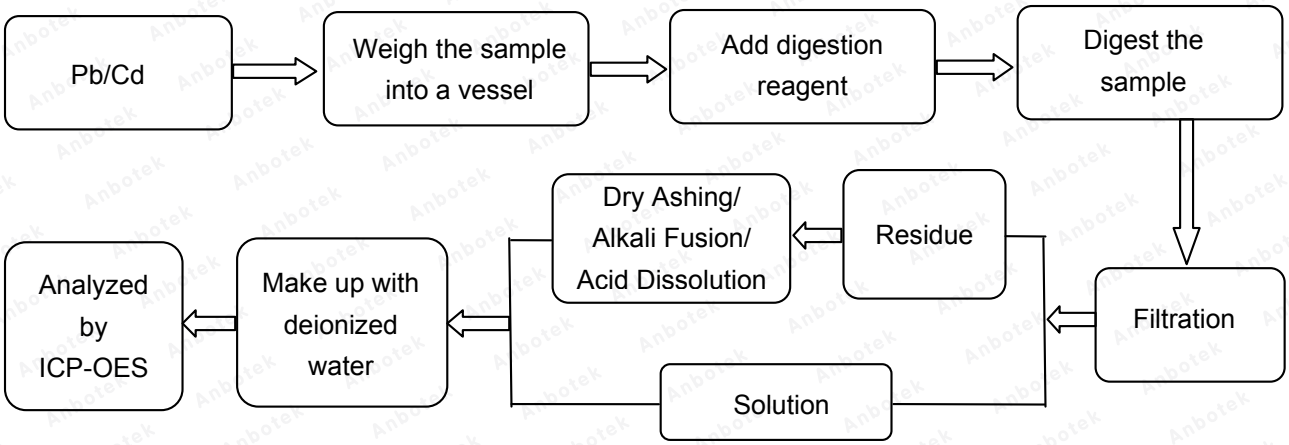
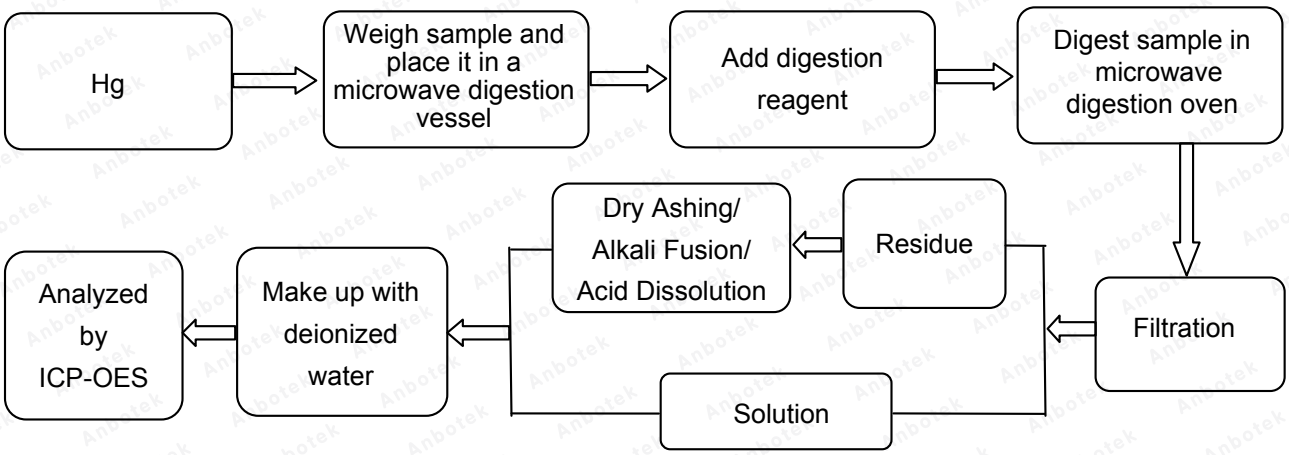
Test Process:

The sample(s) had been dissolved totally tested for Lead, Cadmium, Mercury.

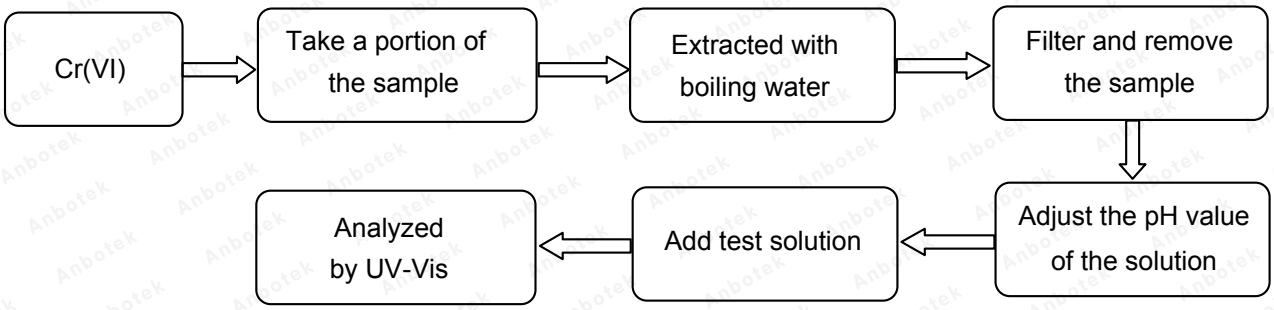
◆ **IEC 62321-5:2013 Ed.1.0**



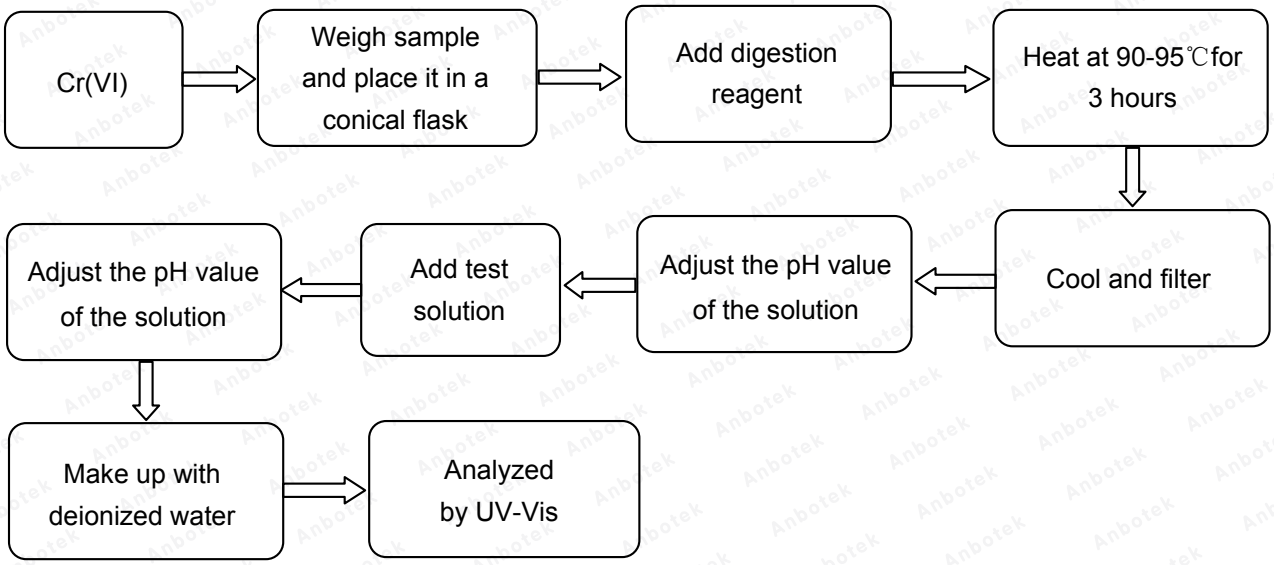
◆ **IEC 62321-4:2013 Ed.1.0**



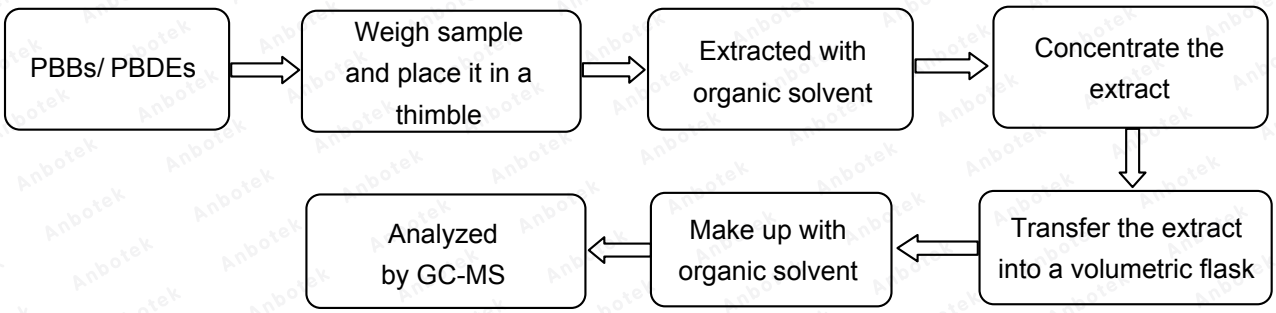
◆ **IEC 62321-7-1:2015 Ed.1.0**



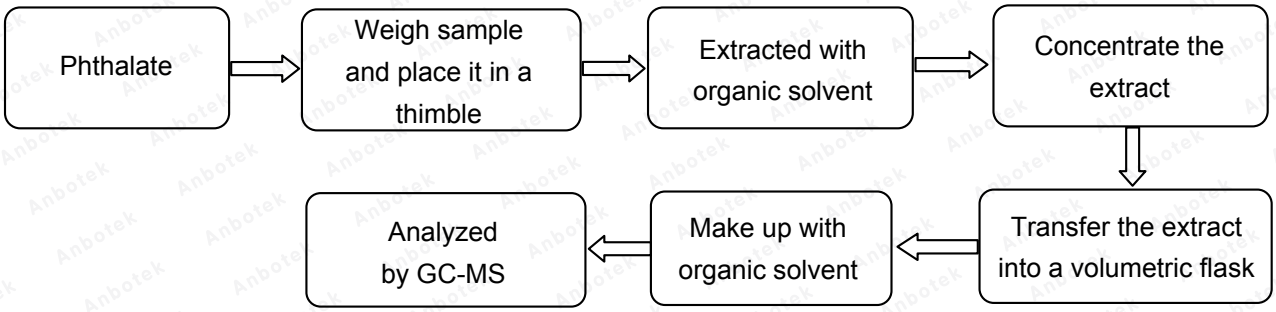
◆ **IEC 62321:2008 Ed.1 Annex C**



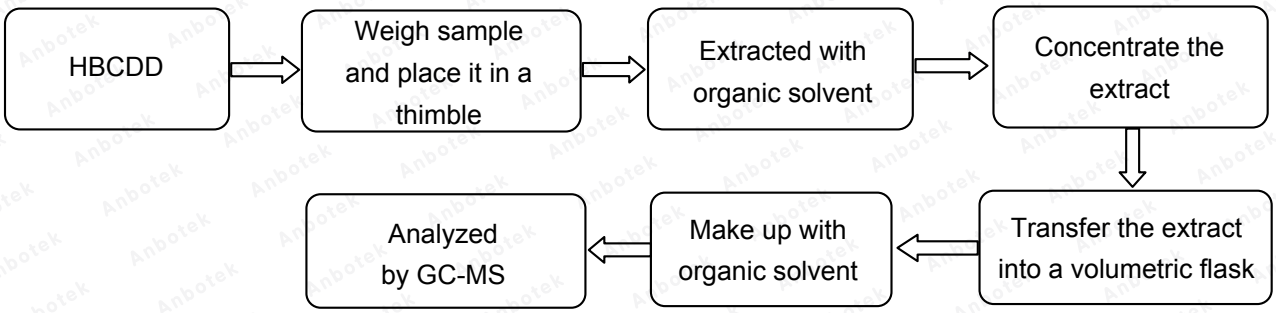
◆ **IEC 62321-6:2015 Ed.1.0**



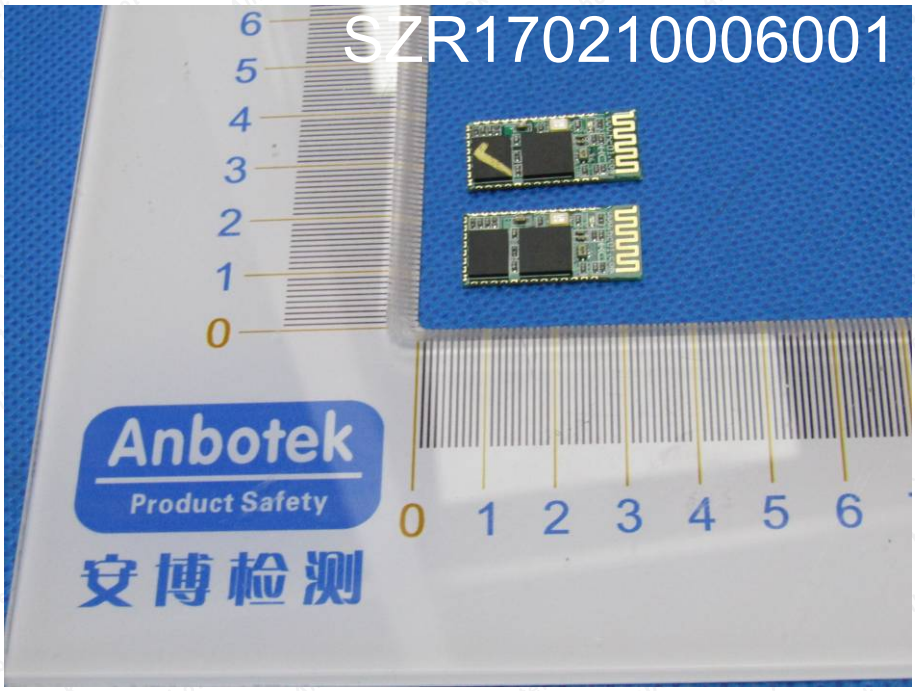
◆ **EN14372:2004**



◆ **US EPA 3540C:1996**



Photograph of Sample



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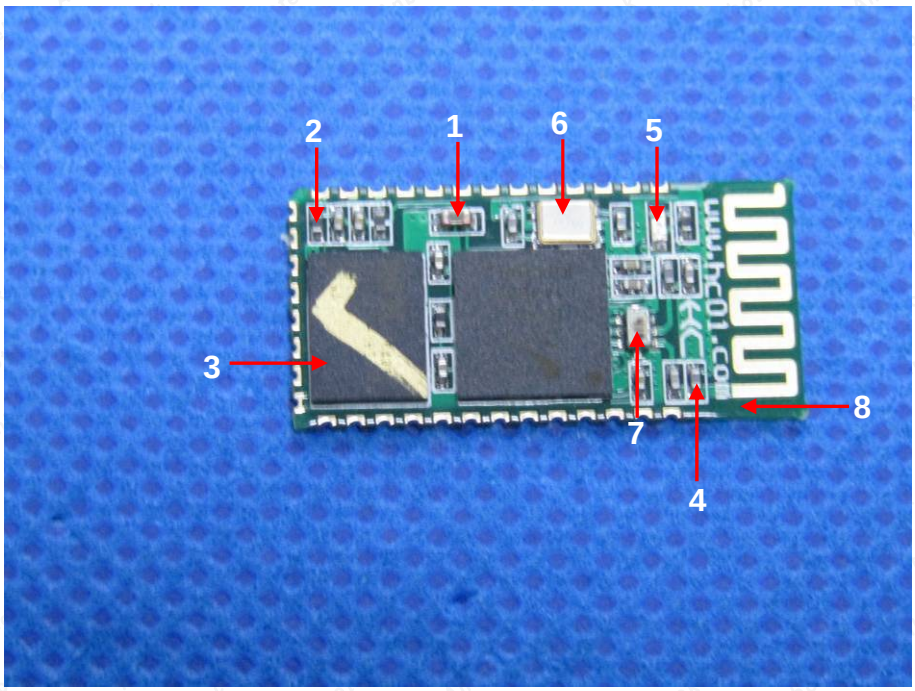
Photo(s) of the tested component(s)



***** End of Report *****

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