Shenzhen Centre Quality Accreditation Technology Co., Ltd.

Address:1 F., Block B of Complex Building, Baisha Logistics Park, No.3011
Shahe West Road, Nanshan District, Shenzhen, China

Telephone: +86-755-26648640
Fax: +86-755-26648637
Website: www.cqa-cert.com

Report No.: CQASZ160101319E
Report Version: V01

MEASUREMENT REPORT
FCC Report

Applicant:	Shenzhen Yuejiang Technology Co., Ltd
Address of Applicant:	Bldg C2, 18/F, Nanshan iPark, No. 1001 Xueyuan Avenue, Nanshan District, Shenzhen, China
Manufacturer:	Shenzhen Yuejiang Technology Co., Ltd
Address of Manufacturer:	Bldg C2, 18/F, Nanshan iPark, No. 1001 Xueyuan Avenue, Nanshan District, Shenzhen, China
Equipment Under Test (EUT):	
Product:	Dobot arm
Model No.:	Dobot 100
Brand Name:	N/A
FCC ID:	2AHI4100WA168
Standards:	47 CFR Part 15B
Date of Test:	2016-02-01 to 2016-02-24
Date of Issue:	2016-02-24
Test Result :	**PASS***

Reviewed By: _____
(Aaron Ma)

Approved By: _____
(Owen Zhou)

Shenzhen Centre Quality Accreditation Technology Co., Ltd.

* In the configuration tested, the EUT complied with the standards specified above.

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ160101319E	Rev.01	Initial report	2016-02-24

2 Test Summary

Test Item	Test Requirement	Test method	Result
Radiated Emission	47 CFR Part 15B	ANSI C63.4 (2014)	PASS
Conducted Emission (150KHz to 30MHz)	47 CFR Part 15B	ANSI C63.4 (2014)	PASS

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4 General Information

4.1 Client Information

Applicant:	Shenzhen Yuejiang Technology Co., Ltd
Address of Applicant:	Bldg C2, 18/F, Nanshan iPark, No. 1001 Xueyuan Avenue, Nanshan District, Shenzhen, China
Manufacturer:	Shenzhen Yuejiang Technology Co., Ltd
Address of Manufacturer:	Bldg C2, 18/F, Nanshan iPark, No. 1001 Xueyuan Avenue, Nanshan District, Shenzhen, China

4.2 General Description of EUT

Name:	Dobot arm	
Model No.:	Dobot100	
Trade Mark:	N/A	
Hardware Version:	V1.0.0	
Software Version:	V1.0.0	
Highest Operating Frequency:	100MHz	
Sample Type:	Fixed production	
Power Supply:	AC/DC Adapter:	Input: AC100-240V 50/60Hz Output: DC12V 5A
	EUT Power Supply:	DC12V
Test Voltage:	AC120V 60Hz	

4.3 Test Environment

Operating Environment:	
Temperature:	24.0 °C
Humidity:	52 % RH
Atmospheric Pressure:	1008 mbar

4.4 Description of Support Units

The EUT has been tested with associated equipment below.

Description	Manufacturer	Model No.
PC	Lenovo	Lenovo ideapad 100-14IBY
Mouse	Lenovo	KM040
AC/DC Adapter	DS	GMY-1260W-5F

4.5 Test Location

All tests were performed at:

Shenzhen CTL Testing Technology Co., Ltd., Shenzhen EMC Laboratory,

1/F.-A, Baisha Technology Park, No.3011, Shahexi Road, Nanshan District, Shenzhen, Guangdong, China

All tests were sub-contracted.

4.6 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

FCC – Registration No.: 970318

Shenzhen CTL Testing Technology Co., Ltd. has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 970318

4.7 Deviation from Standards

None.

4.8 Abnormalities from Standard Conditions

None.

4.9 Other Information Requested by the Customer

None.

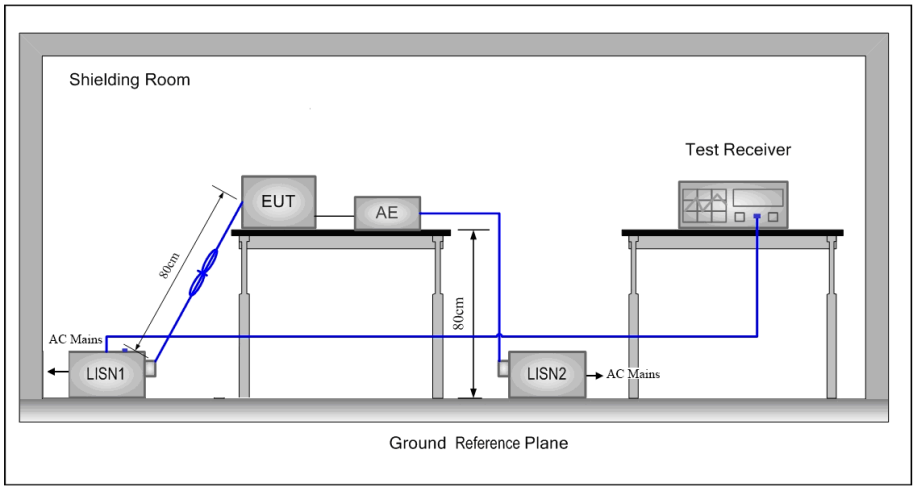
4.10 Equipment List

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Due Date
1	Bilog Antenna	Sunol Sciences Corp.	JB1	A061713	2016/06/01
2	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESCI3	103710	2016/06/01
3	Preamplifier 0.1-1300MHz	HP	8447D	3113A07663	2016/5/18
4	Controller	EM Electronics	Controller EM 1000	N/A	2016/5/20
5	Transient Limiter	Com-Power	LIT-153	532226	2016/06/01
6	LISN	R&S	ENV216	101316	2016/06/01
7	LISN	SCHWARZBECK	NSLK8127	8127687	2016/06/01
8	Temperature/Humidity Meter	Gangxing	CTH-608	02	2016/05/19
9	RF Cable(0-1GHz)	HUBER+SUHNER	RG174	N/A	2016/05/19

5 Test results and Measurement Data

5.1 Conducted Emissions

<table>
<tr><td>Test Requirement:</td><td>47 CFR Part 15B</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.4: 2014</td></tr>
<tr><td>Test Frequency Range:</td><td>150kHz to 30MHz</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><td rowspan="2">Frequency range (MHz)</td><td colspan="2">Limit (dBuV)</td></tr>
<tr><td>Quasi-peak</td><td>Average</td></tr>
<tr><td>0.15-0.5</td><td>66 to 56*</td><td>56 to 46*</td></tr>
<tr><td>0.5-5</td><td>56</td><td>46</td></tr>
<tr><td>5-30</td><td>60</td><td>50</td></tr>
</table>
* Decreases with the logarithm of the frequency.
</td></tr>
<tr><td>Test Procedure:</td><td>1) The mains terminal disturbance voltage test was conducted in a shielded room.
2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,
4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2014 on conducted measurement.</td></tr>
</table>

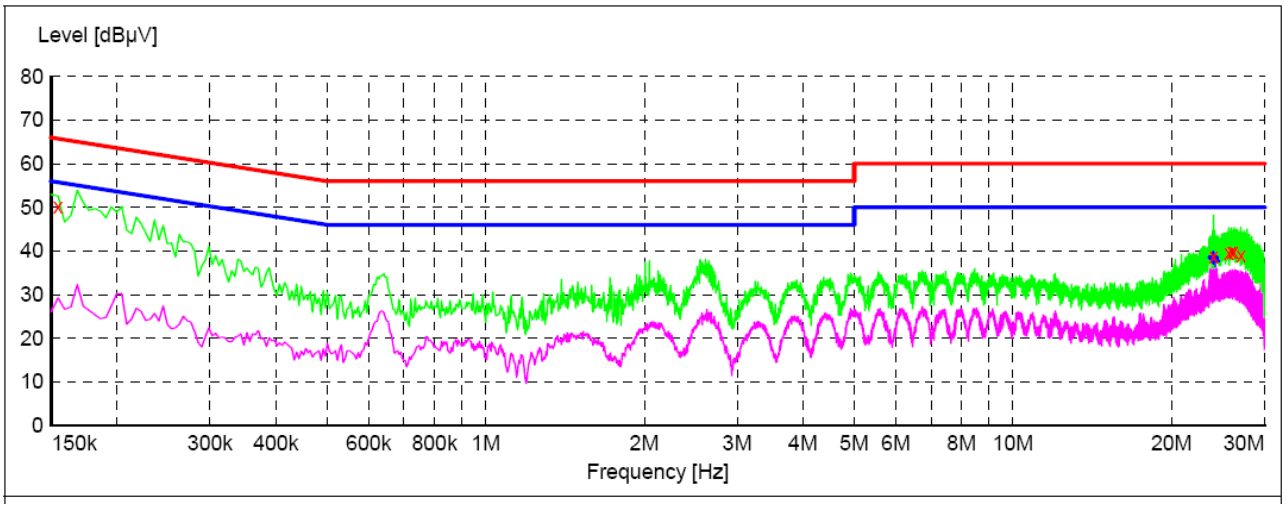
Test setup:	
Instruments Used:	Refer to section 4.10 for details
Test Mode:	On Mode: Exchange data with PC
Test Voltage	120V 60Hz
Test Results:	Pass

Measurement Data

An initial pre-scan was performed on the live and neutral lines with peak detector.

Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

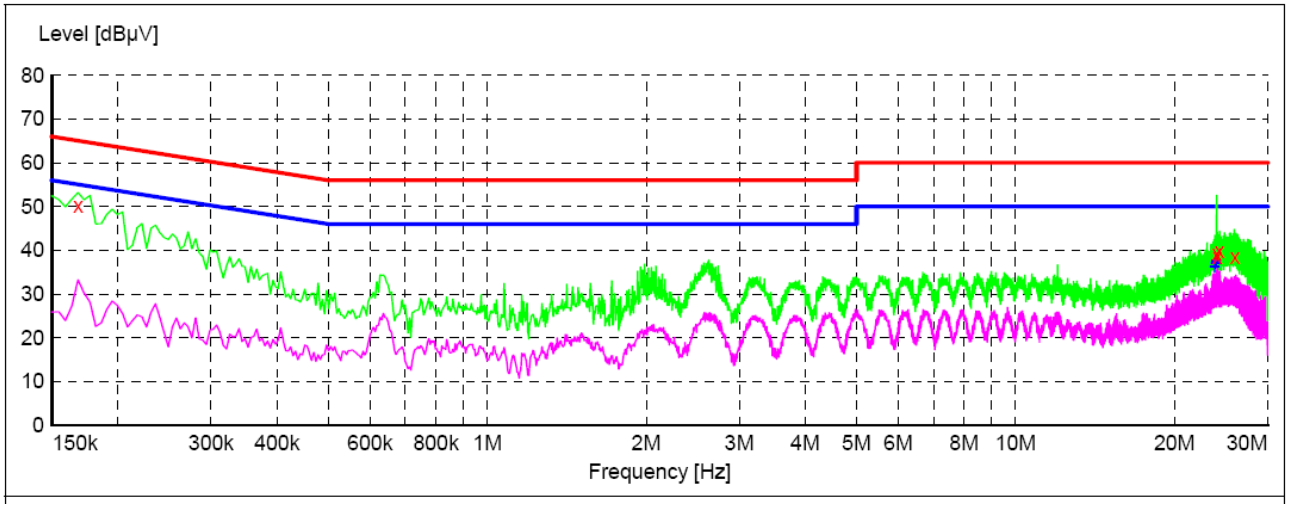
Live Line:



Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.154501	50.20	10.2	66	15.6	QP	L1	GND
24.031501	38.80	11.1	60	21.2	QP	L1	GND
25.674001	39.50	11.1	60	20.5	QP	L1	GND
26.011501	39.90	11.2	60	20.1	QP	L1	GND
26.259001	39.80	11.2	60	20.2	QP	L1	GND
27.064501	39.10	11.2	60	20.9	QP	L1	GND

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
23.923501	38.40	11.1	50	11.6	AV	L1	GND
24.000001	38.80	11.1	50	11.2	AV	L1	GND
24.040501	38.20	11.1	50	11.8	AV	L1	GND
24.076501	38.40	11.1	50	11.6	AV	L1	GND
24.193501	37.70	11.1	50	12.3	AV	L1	GND

Neutral Line:



Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.168001	50.30	10.2	65	14.8	QP	N	GND
24.004501	39.20	11.1	60	20.8	QP	N	GND
24.072001	38.50	11.1	60	21.5	QP	N	GND
24.306001	39.90	11.1	60	20.1	QP	N	GND
26.007001	38.50	11.2	60	21.5	QP	N	GND

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
23.847001	36.30	11.1	50	13.7	AV	N	GND
23.923501	37.20	11.1	50	12.8	AV	N	GND
24.000001	37.70	11.1	50	12.3	AV	N	GND

Notes:

1. The following Quasi-Peak and Average measurements were performed on the EUT,

2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.

5.2 Radiated Emission

Test Requirement:	47 CFR Part 15B
Test Method:	ANSI C63.4: 2014
Test Site:	Measurement Distance: 3m (Semi-Anechoic Chamber)
Receiver Setup:	

Frequency	Detector	RBW	VBW	Remark
30MHz-1GHz	Quasi-peak	100kHz	300kHz	Quasi-peak Value
Above 1GHz	Peak	1MHz	3MHz	Peak Value

Limit:

Frequency	Limit (dBuV/m @3m)	Remark
30MHz-88MHz	40.0	Quasi-peak Value
88MHz-216MHz	43.5	Quasi-peak Value
216MHz-960MHz	46.0	Quasi-peak Value
960MHz-1GHz	54.0	Quasi-peak Value
Above 1GHz	54.0	Average Value
	74.0	Peak Value

Note:

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	**Upper frequency of measurement Range (MHz)**
Below 1.705	30
1.705 to 108	1000
108 to 500	2000
500 to 1000	5000
Above 1000	5th harmonic of the highest frequency or 40GHz, whichever is lower

Test Procedure:

a. Below 1G: The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
b. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
c. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
d. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
e. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Test Setup:	

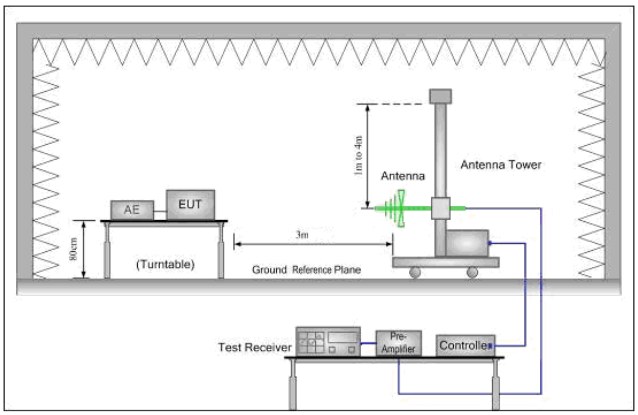
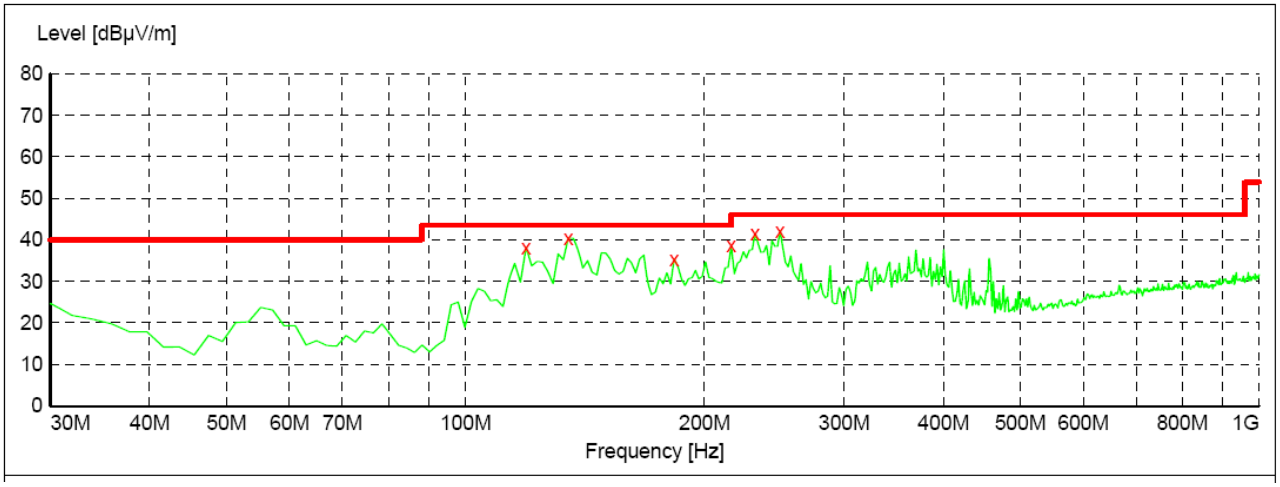


Figure 1. 30MHz to 1GHz

Instruments Used:	Refer to section 4.10 for details
Test Mode:	On mode: Exchange data with PC
Test Results:	Pass

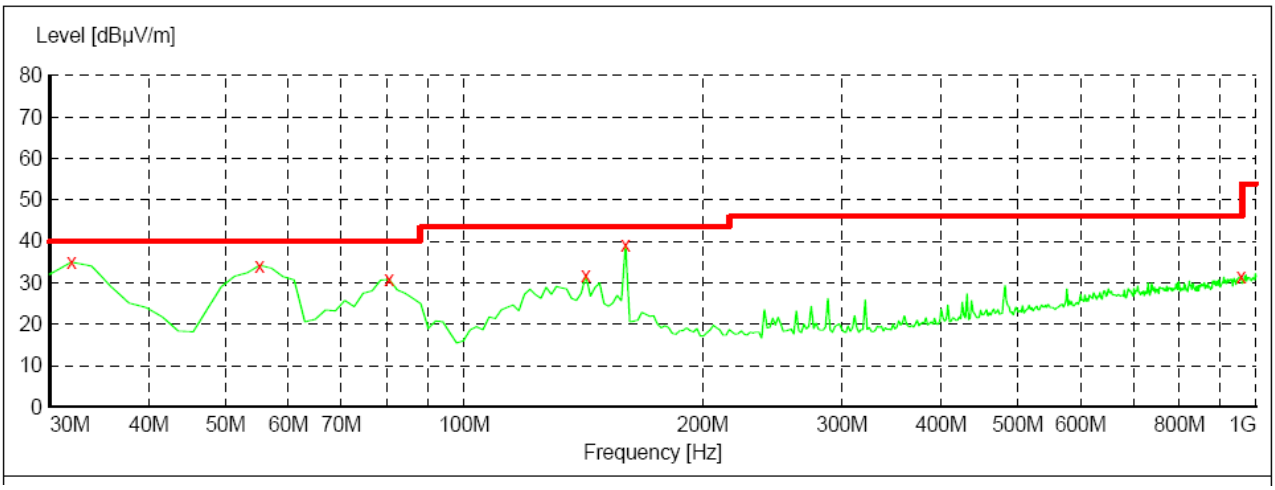
Peak value: 30MHz~1GHz

Horizontal



Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB
119.240000	38.20	15.2	43.5	5.3
134.760000	40.40	14.8	43.5	3.1
183.260000	35.40	13.3	43.5	8.1
216.240000	38.60	14.2	46.0	7.4
231.760000	41.50	14.1	46.0	4.5
249.220000	42.20	14.1	46.0	3.8

Vertical



Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB
31.940000	35.00	19.6	40.0	5.0
55.220000	34.20	8.3	40.0	5.8
80.440000	30.80	8.8	40.0	9.2
142.520000	31.70	14.5	43.5	11.8
159.980000	39.20	13.9	43.5	4.3
957.320000	31.50	26.7	46.0	14.5

Remark:

1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor

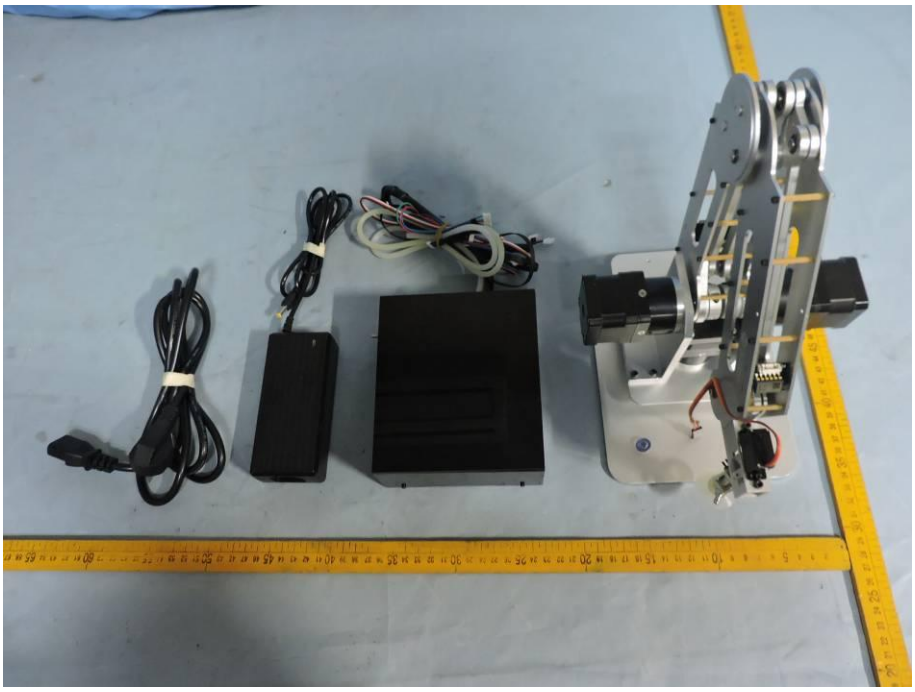
2) The highest operating frequency of the EUT is 100MHz, so the upper frequency of measurement range is 1000MHz

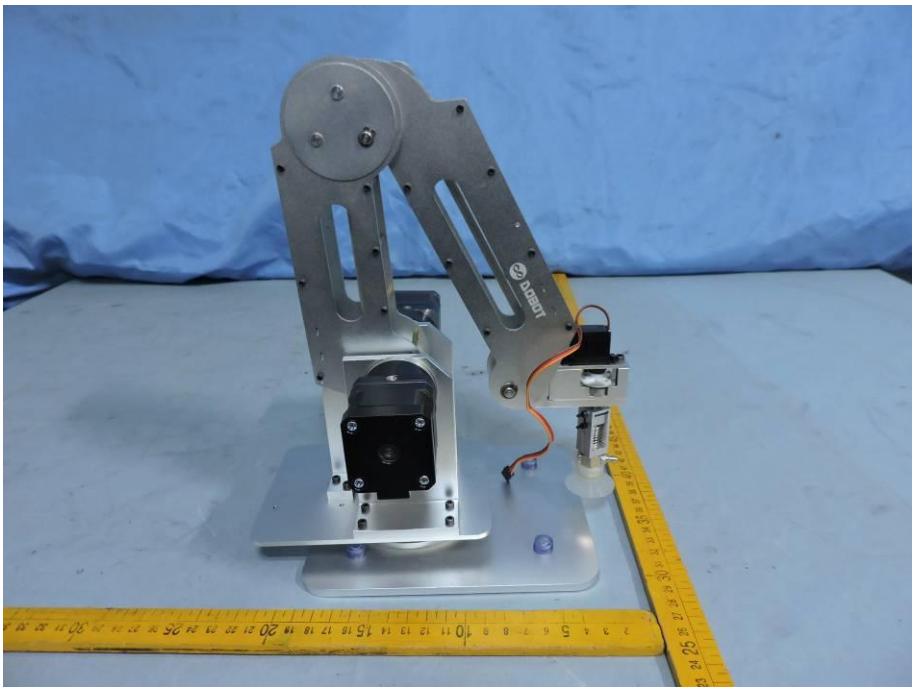
6 Photographs - EUT Test Setup

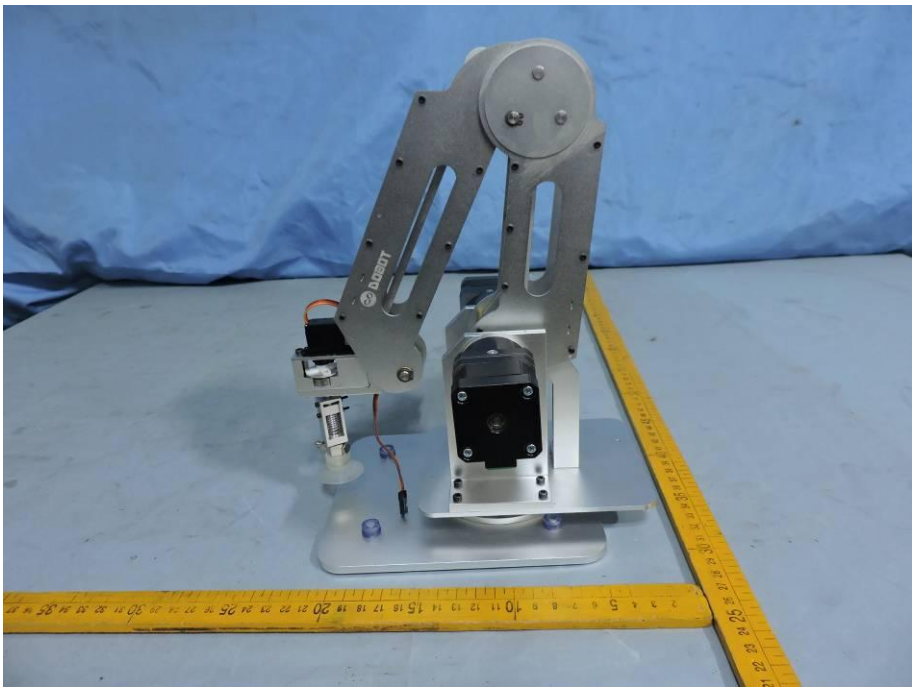
6.1 Conducted Emission

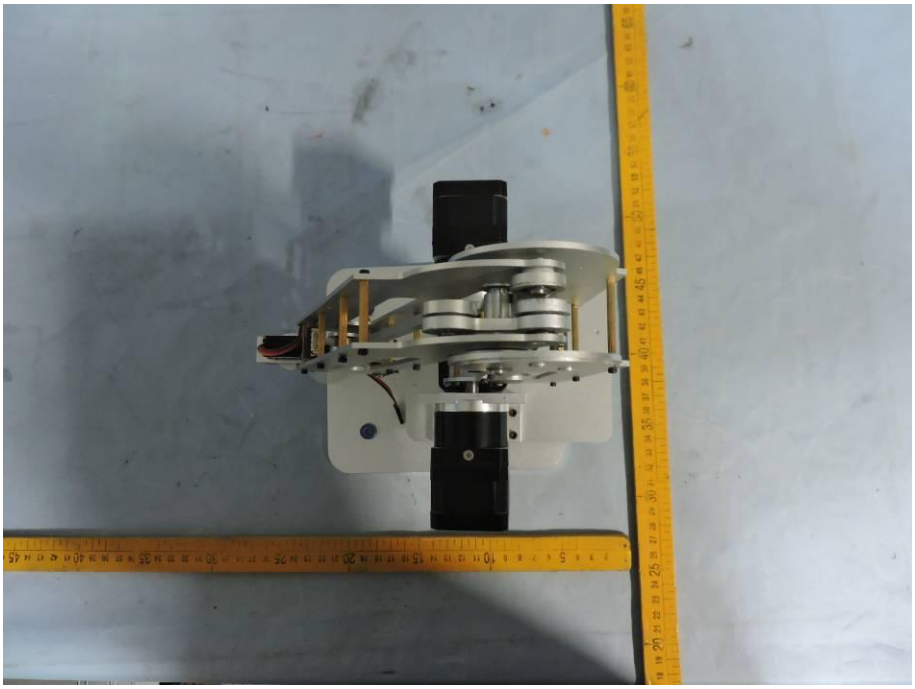
6.2 Radiatd Emission

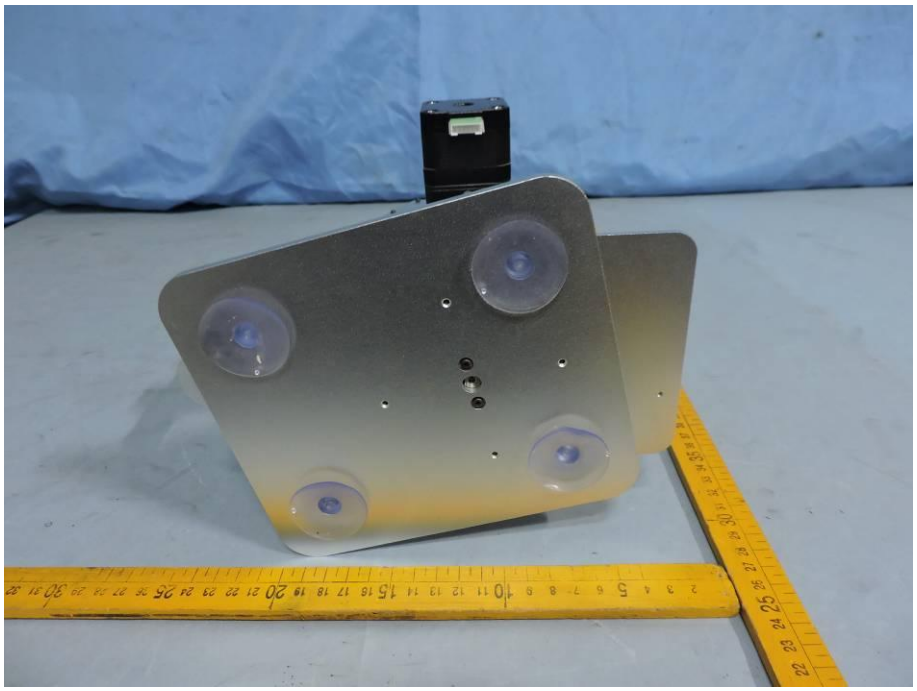
7 Photographs of EUT Constructional Details

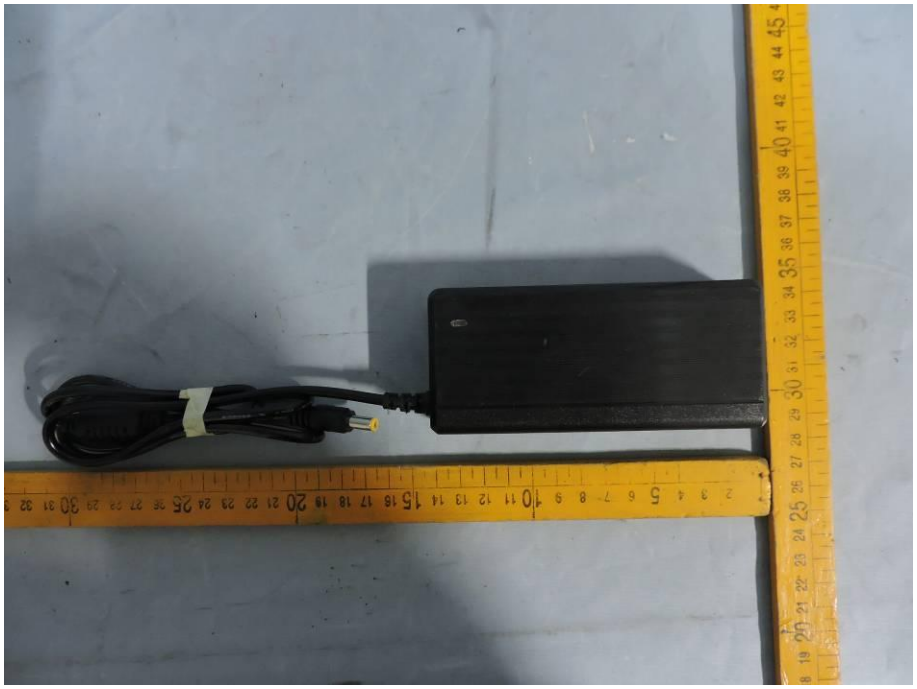




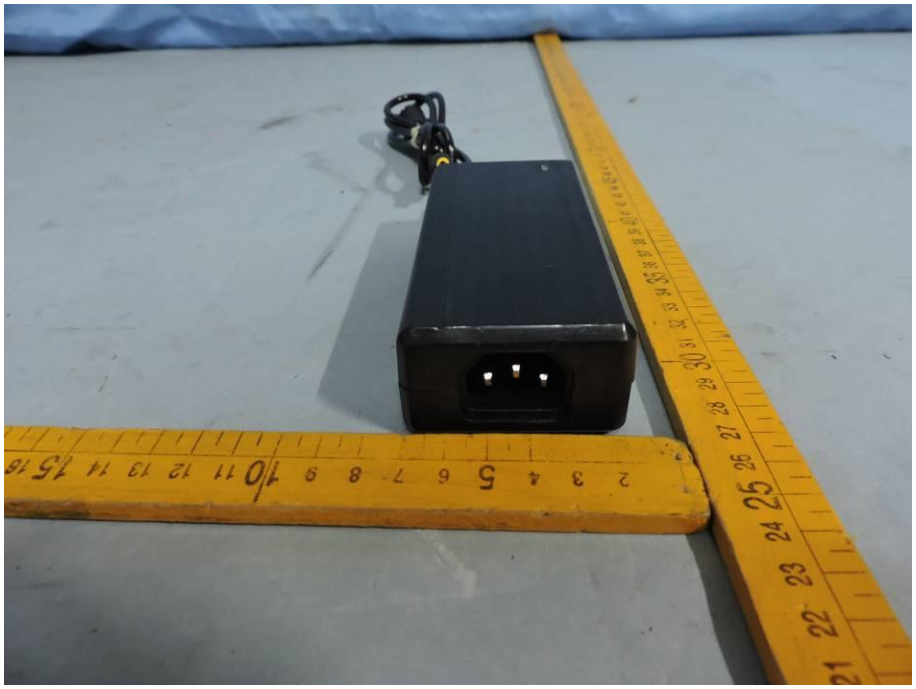


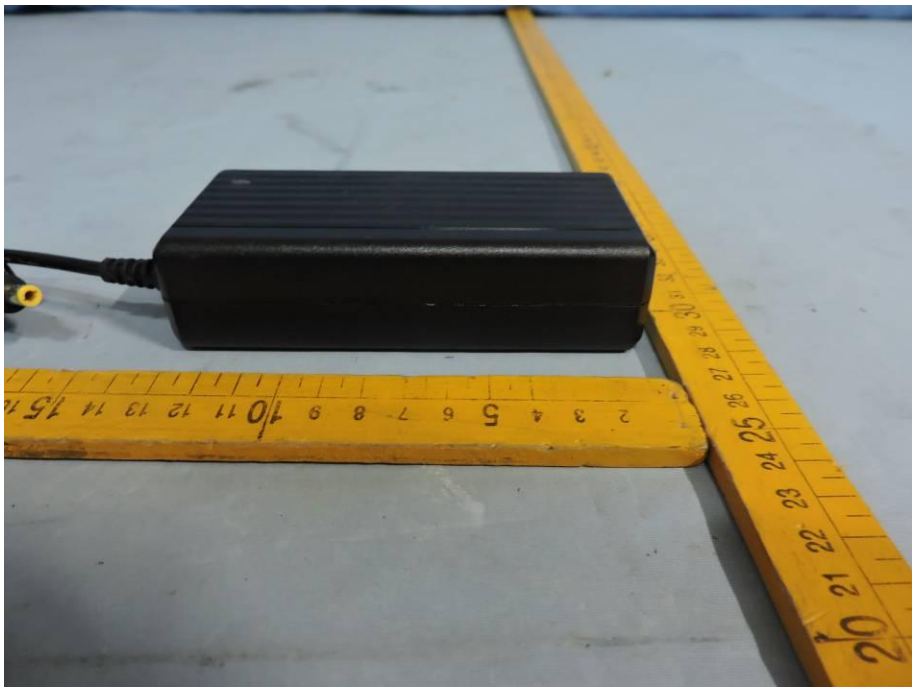


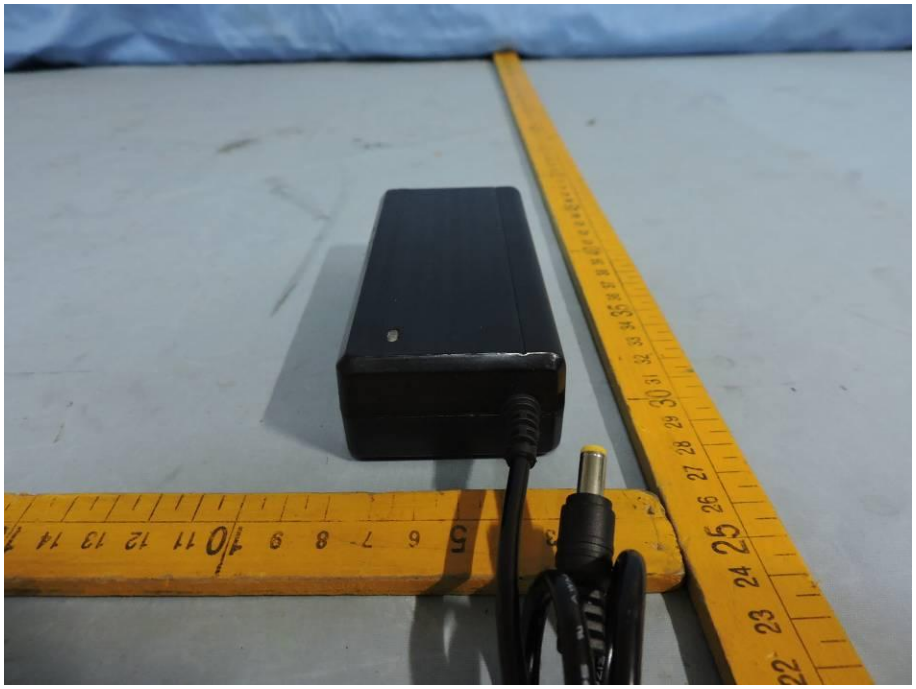


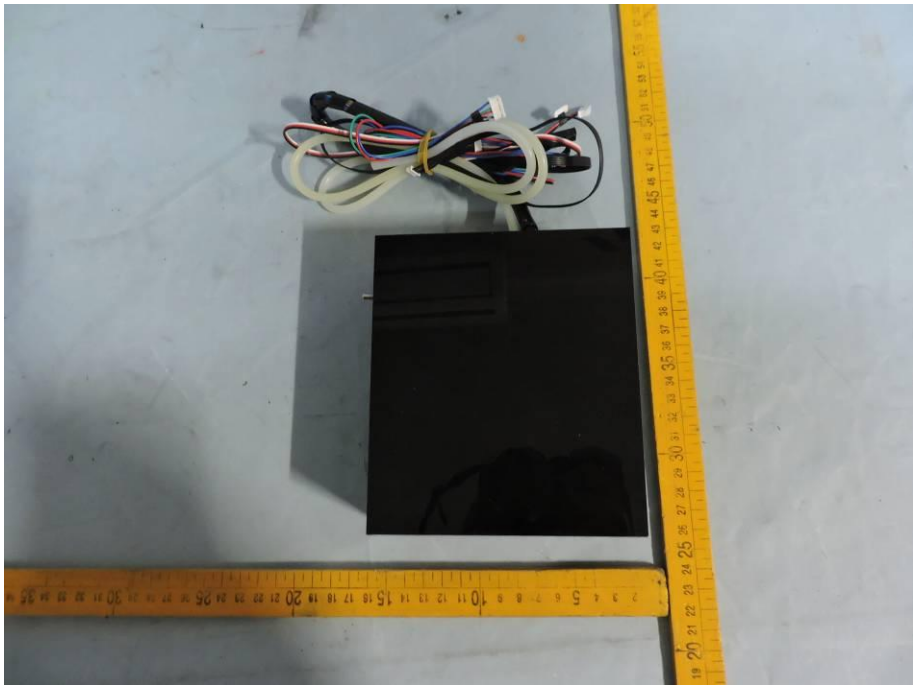


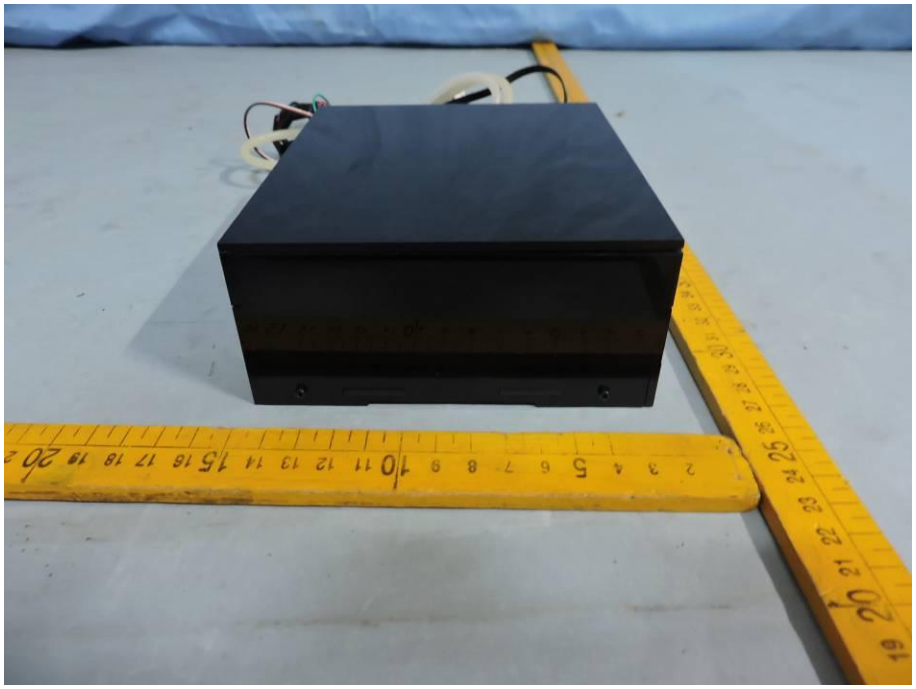
AC/DC ADAPTER

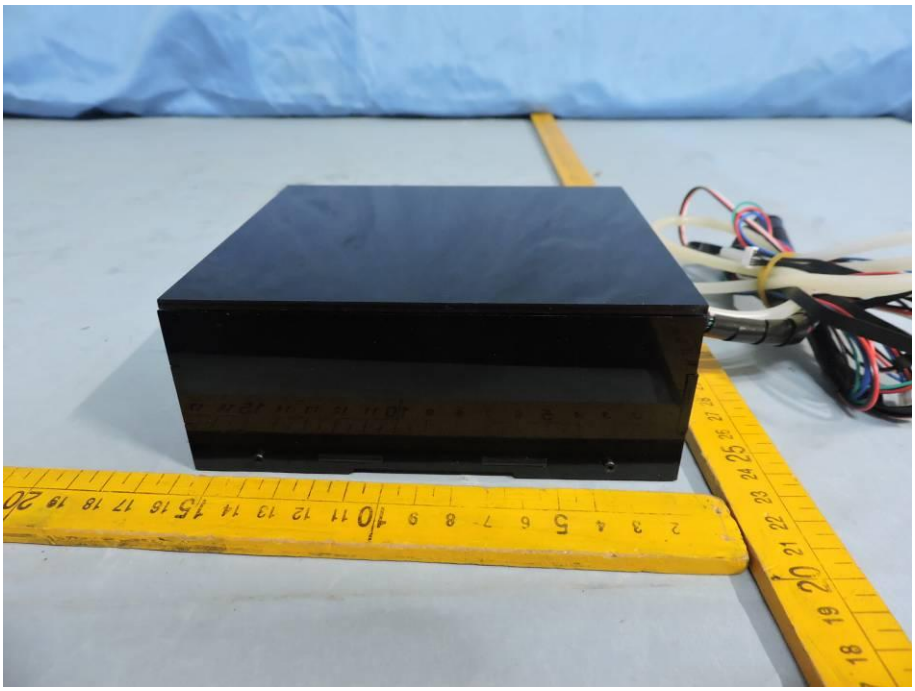


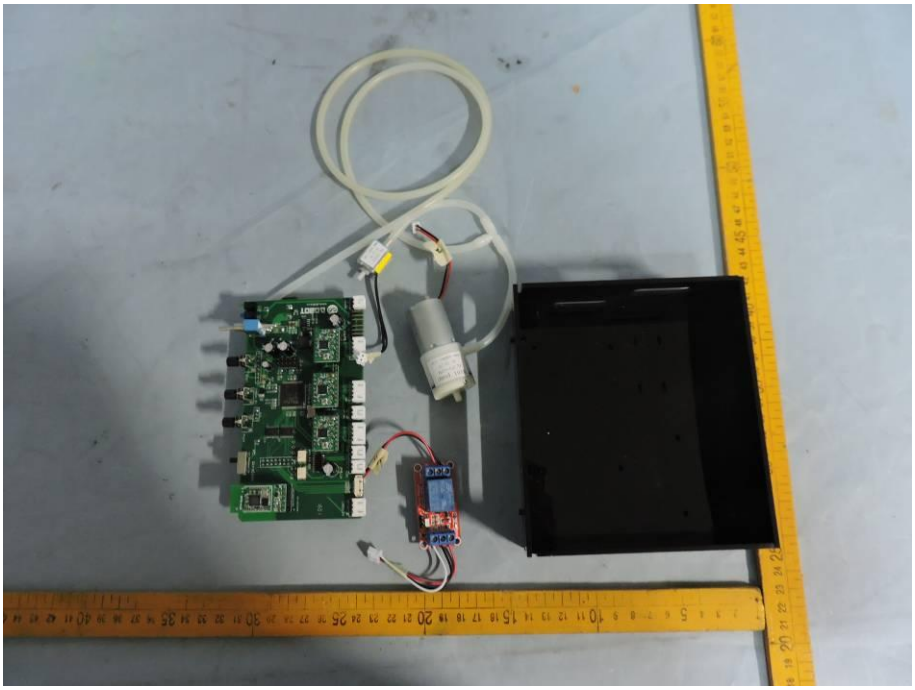


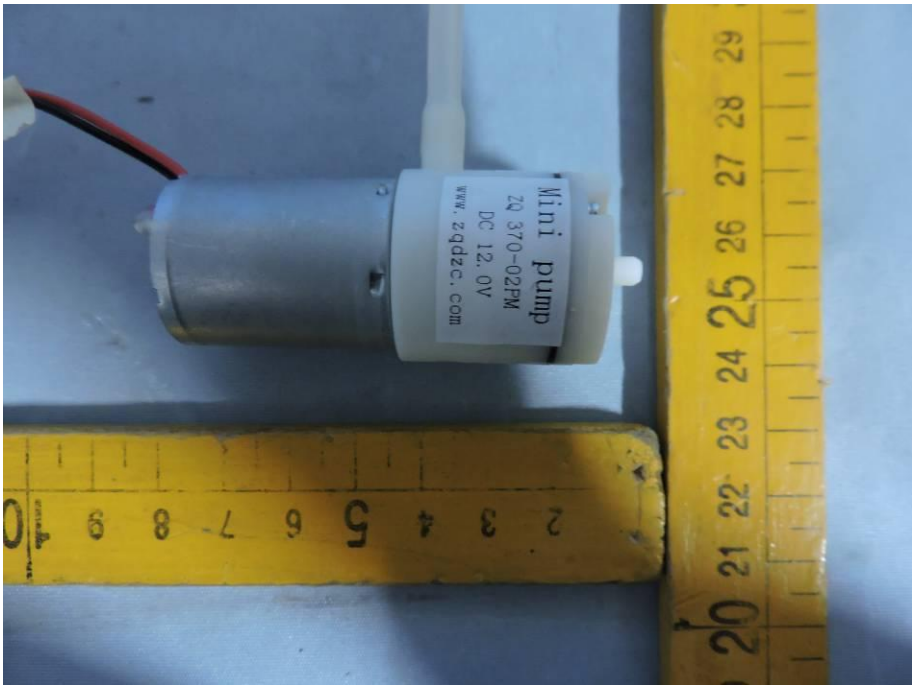


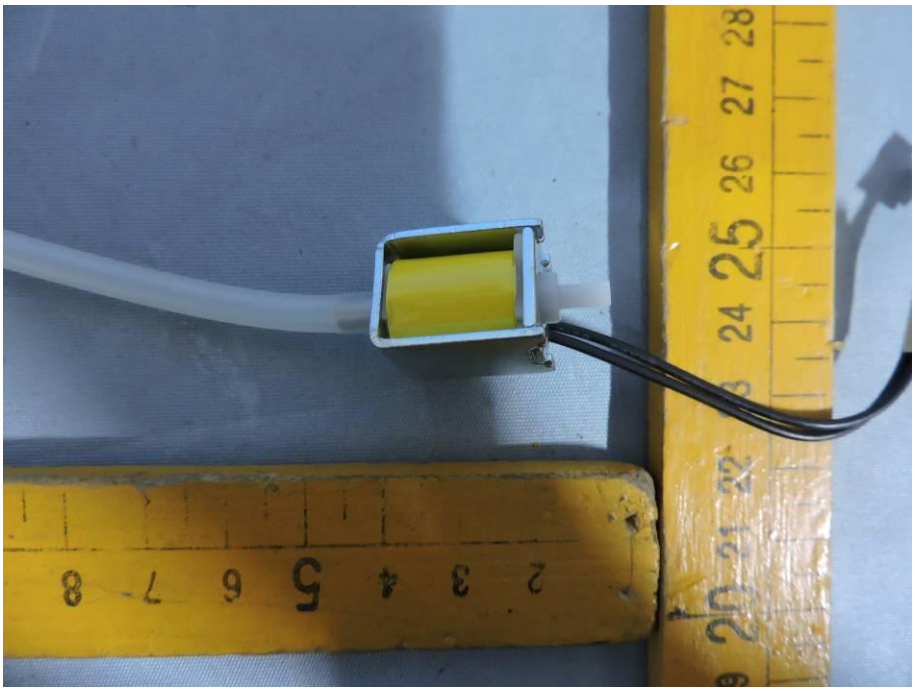


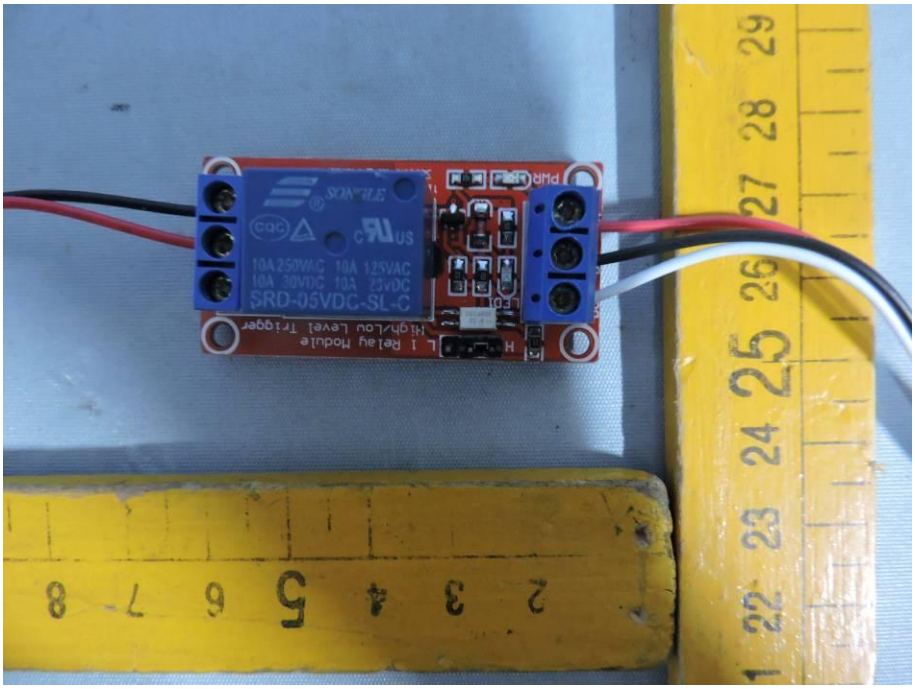


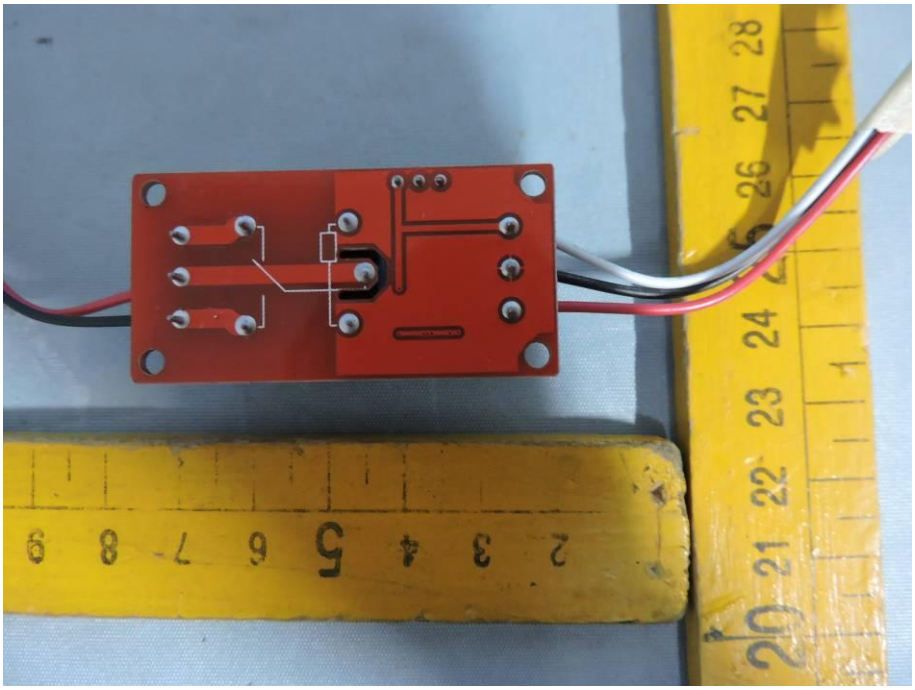


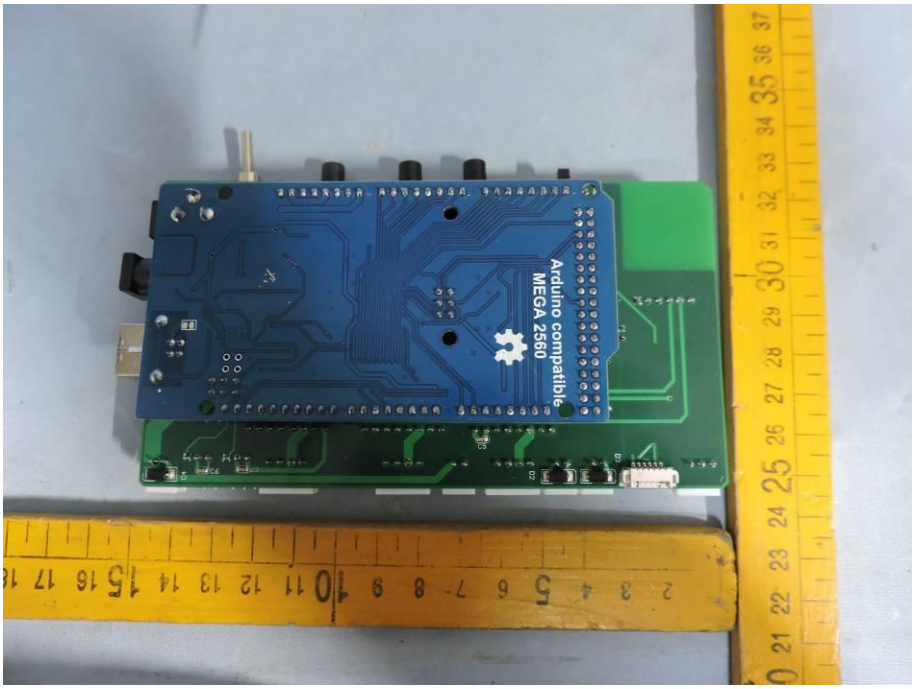


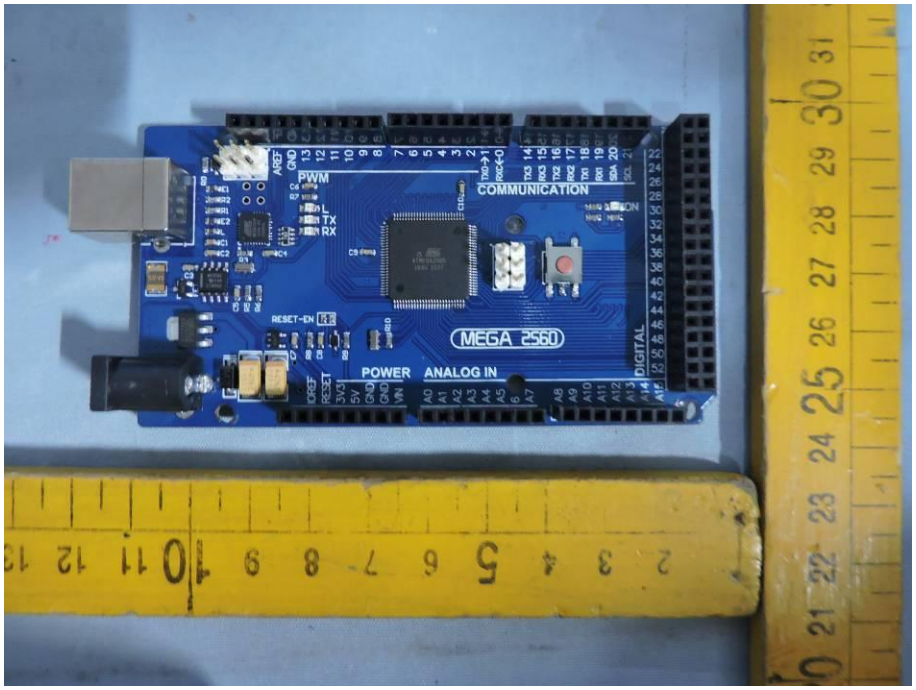

Mini pump
ZQ 370-02PM
DC 12.0V
www.zqdzc.com

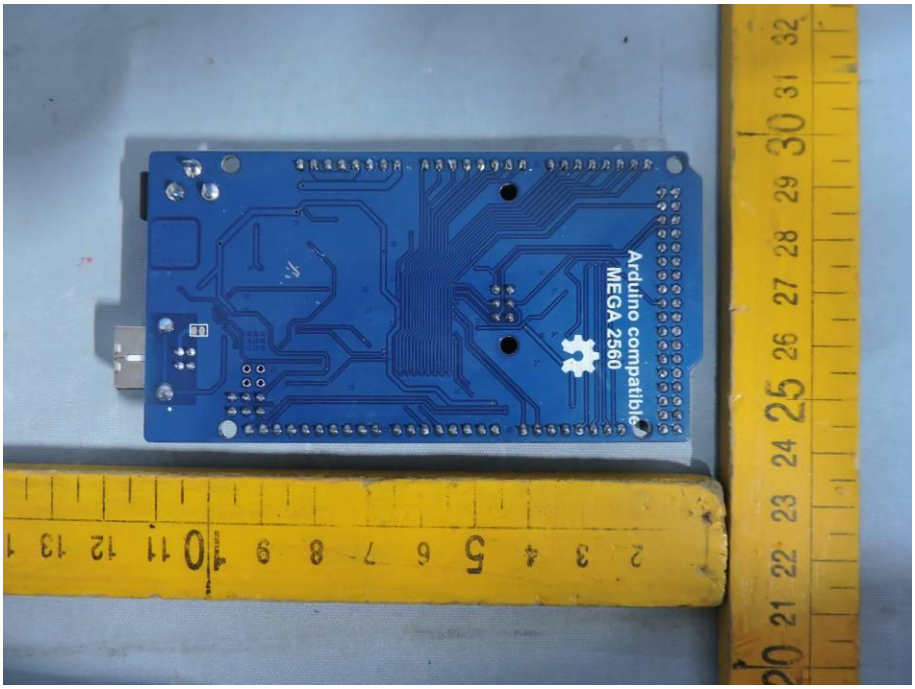


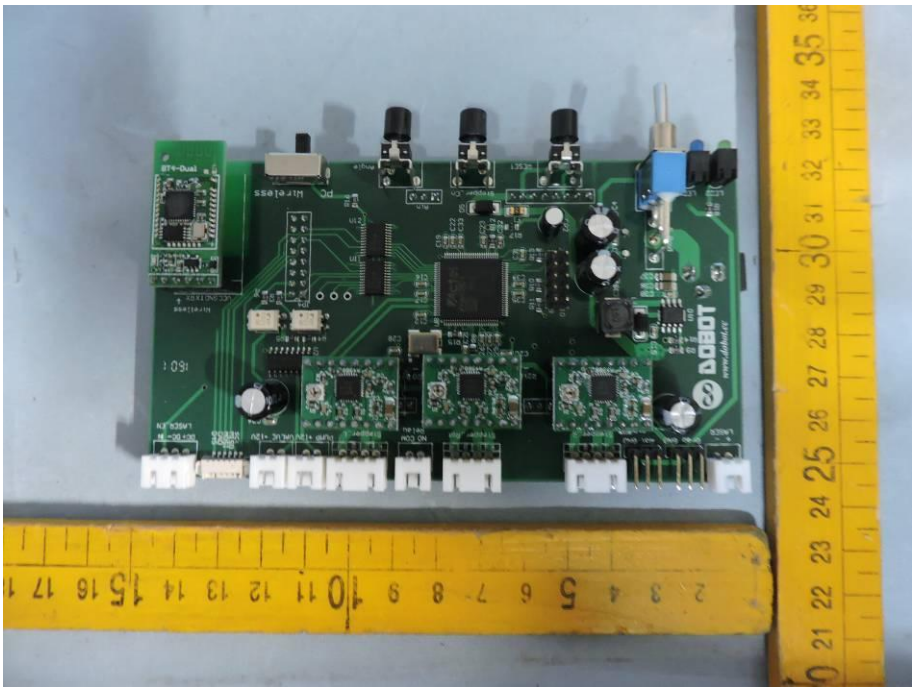

SRD-05VDC-SL-C
10A 250VAC 10A 125VAC
10A 30VDC 10A 28VDC
1 Relay Module
High/Low Level Trigger

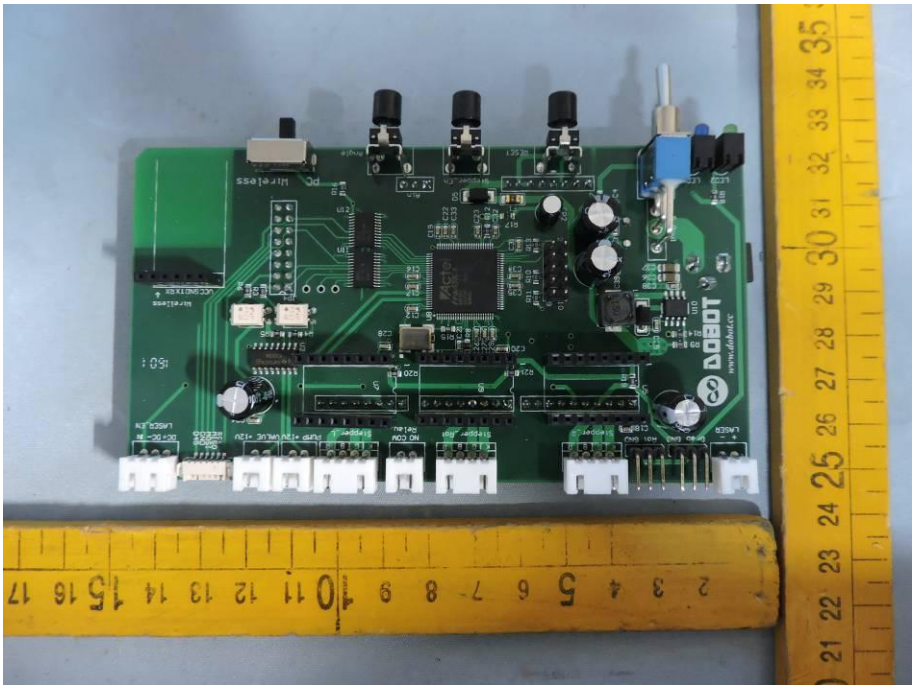


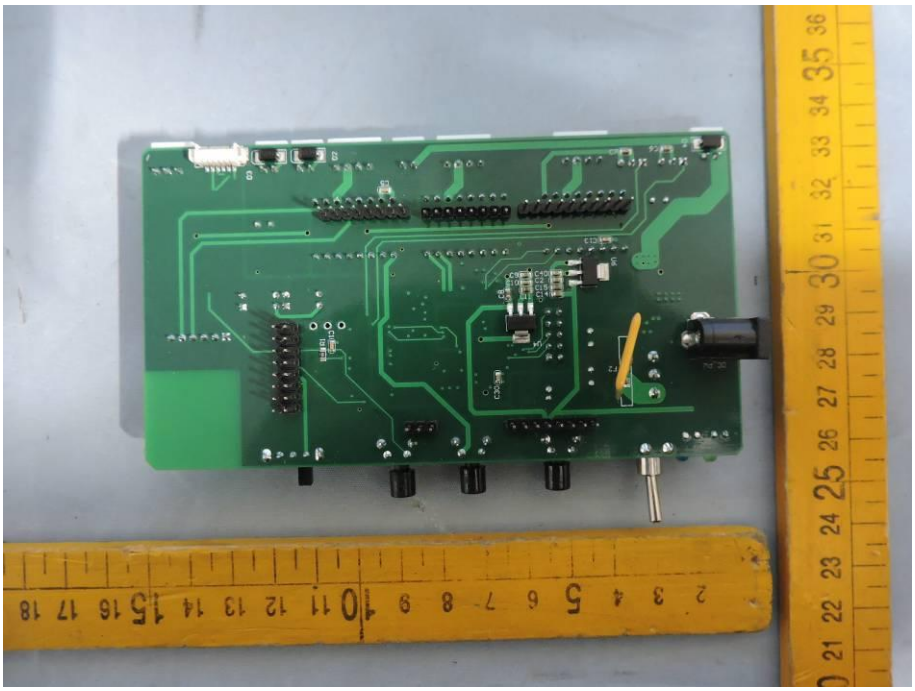

Arduino compatible
MEGA 2560

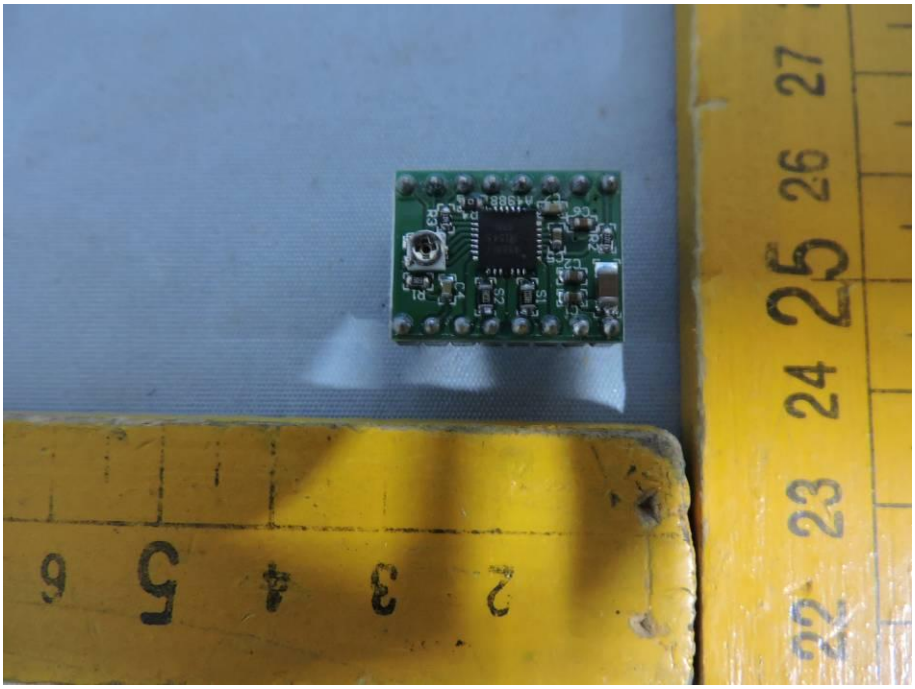

MEGA 2560
COMMUNICATION
PWM
POWER
ANALOG IN
DIGITAL

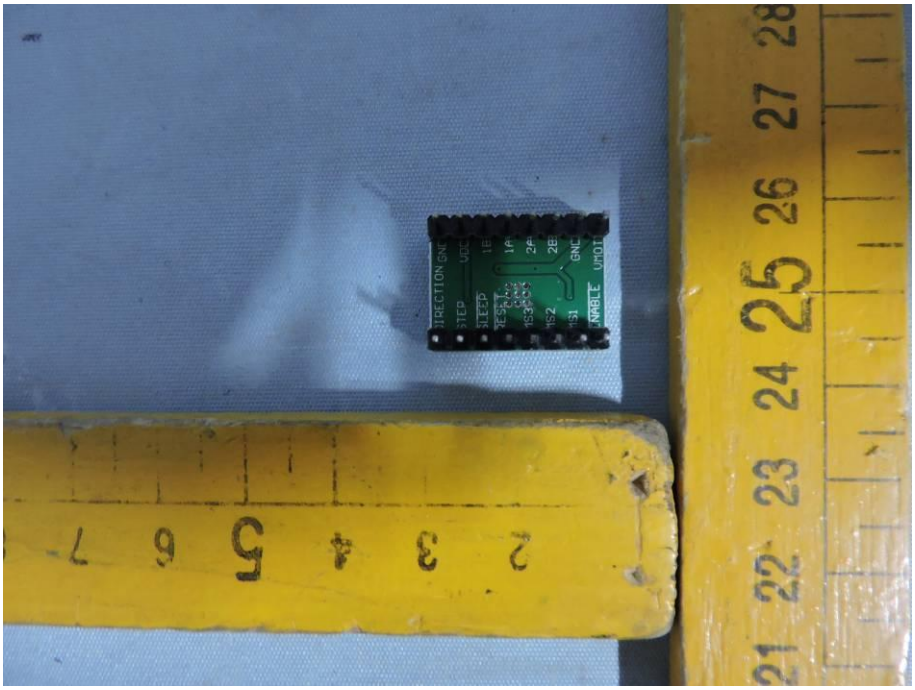

Arduino compatible
MEGA 2560

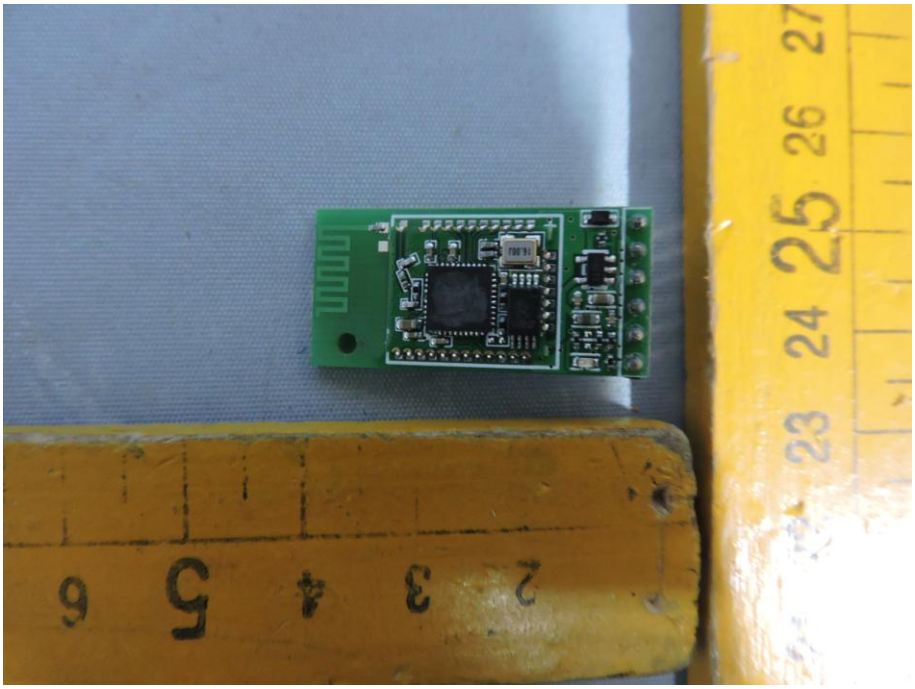


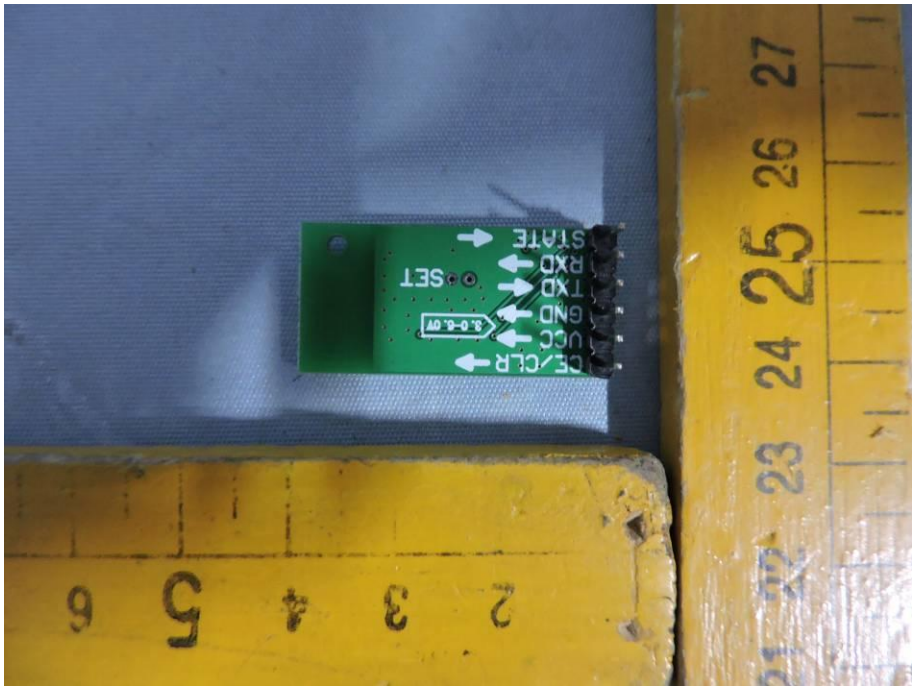







DIRECTION
STEP
SLEEP
ENABLE





END OF THE REPORT