# EN 300 330-1/ EN 300 330-2 RADIO TEST REPORT

On Behalf of

## Shanghai Anviz Technology Co.Ltd

## Fingerprint & RFID Time Attendance

## Model No.: A300

Prepared for : Shanghai Anviz Technology Co.Ltd
Address : 2th Floor,4289Jindu Road,Shanghai China

Prepared By : Shenzhen Alpha Product Testing Co., Ltd.
Address : 2F, Building B, East Area of Nanchang Second Industrial Zone, Gushu 2nd Road, Bao'an District, Shenzhen 518126, P.R. China

| | | |
|---|---|---|
| Report Number | : | T1861387 02 |
| Date of Receipt | : | July 18, 2016 |
| Date of Test | : | July 19, 2016- July 25, 2016 |
| Date of Report | : | July 25, 2016 |
| Version Number | : | REV0 |

Contents

# DECLARATION

Applicant : Shanghai Anviz Technology Co.Ltd

Manufacturer : Shanghai Anviz Technology Co.Ltd

Product : Fingerprint & RFID Time Attendance

(A)Model No. : A300

(B)Trade Name : ANVIZ

(C)Power supply : DC 5V from USB port

Measurement Procedure Used:

**ETSI EN 300 330-1 V1.7.1: Electromagnetic compatibilityand Radio spectrum Matters (ERM);Short Range Devices (SRD);Radio equipment in the frequency range9 kHz to 25 MHz and inductive loop systemsin the frequency range 9 kHz to 30 MHz;Part 1: Technical characteristics and test methods**

**ETSI EN 300 330-2 V 1.5.1: Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Radio equipment in the frequency range 9 kHz to 25 MHz and inductive loop systems in the frequency range 9 kHz to 30 MHz; Part 2: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive**

The device described above is tested by Shenzhen Alpha Product Testing Co., Ltd. The measurement results are contained in this test report and Shenzhen Alpha Product Testing Co., Ltd. is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the EN 300 330-1 and EN 300 330-2 requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of Shenzhen Alpha Product Testing Co., Ltd.

Tested by (name + signature).....: Peter Kang, Test Engineer .....

Approved by (name + signature).....: Simple Guan, Project Manager .....

Date of issue..... .....: July 25, 2016

# 1. General Information

## 1.1. Description of Device (EUT)

| | | |
|---|---|---|
| EUT Name | : | Fingerprint & RFID Time Attendance |
| Model No. | : | A300 |
| DIFF | : | N/A |
| Trademark | : | ANVIZ |
| Power supply | : | DC 12V |
| Radio Technology | : | 125KHz SRD |
| Operation frequency | : | 125KHz |
| Antenna Type | : | Integrated Antenna, Maximum Gain is 0dBi. |
| Software version | | N/A |
| Hardware version | | N/A |
| Intend use environment | : | Residential, commercial and light industrial environment |
| Applicant | : | Shanghai Anviz Technology Co.Ltd |
| Address | : | 2th Floor,4289Jindu Road,Shanghai China |
| Manufacturer | | Shanghai Anviz Technology Co.Ltd |
| Address | | 2th Floor,4289Jindu Road,Shanghai China |

## 1.2. Accessories of device (EUT)

| | | |
|---|---|---|
| Accessories1 | : | N/A |
| Model | | N/A |
| Input | | N/A |
| Output | | N/A |
| Accessories2 | : | N/A |
| Model | | N/A |

## 1.3. Test Lab information

Shenzhen Alpha Product Testing Co., Ltd.

Building B, East Area of Nanchang Second, Industrial Zone, Gushu 2nd Road, Bao'an, Shenzhen, China

March 25, 2015 File on Federal Communication Commission
Registration Number: 203110

July 18, 2014 Certificated by IC
Registration Number: 12135A

# 2. Summary of test

## 2.1. Test Standard description:

ETSI EN 300 330-1 V1.7.1: Electromagnetic compatibilityand Radio spectrum Matters (ERM);Short Range Devices (SRD);Radio equipment in the frequency range9 kHz to 25 MHz and inductive loop systemsin the frequency range 9 kHz to 30 MHz;Part 1: Technical characteristics and test methods

ETSI EN 300 330-2 V 1.5.1: Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Radio equipment in the frequency range 9 kHz to 25 MHz and inductive loop systems in the frequency range 9 kHz to 30 MHz; Part 2: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive

## 2.2. Summary of test result

| CLAUSE (ETSI EN300 330) | TEST PARAMETER | RESULTS |
|---|---|---|
| **Transmitter Parameters** | | |
| 7.2 | Transmitter Carrier Output Levels | **PASS** |
| 7.3 | Permitted Frequency Range Of The Modulation Bandwidth | **PASS** |
| 7.4 | Transmitter Spurious Radiated Emission | **PASS** |
| 7.5 | Duty Cycle | **PASS** |
| **Receiver Parameters** | | |
| 8.3 | Receiver spurious emissions | **N/A** |

## 2.3. Block Diagram

1. For radiated test


## 2.4. Test mode

| Tested mode, channel, and data rate information | | | |
|---|---|---|---|
| Mode | data rate (Mpbs)(see Note) | Channel | Frequency (KHz) |
| SRD | N/A | 1 | 125 |
| Note: All the final test were performed using a new battery. | | | |

## 2.5. Test Conditions

| | Normal Conditions | Extreme Conditions |
|---|---|---|
| Temperature range | 15-35℃ | -10℃ and 55℃ |
| Humidity range | 40-75% | 40-75% |
| Pressure range | 86-106kPa | 86-106kPa |
| Power supply | DC 5V from USB port | 207V and 253V ( declared by the manufacturer. ) |

## 2.6. Receiver Class

**Receiver Class:** (Subclause 4.1.1)

☐ Class 1 (Safety critical SRD communication media; i.e. for devices serving systems where failure may result in a physical risk to a person)

☐ Class 2 (Function critical SRD communication media; i.e. when a failure to operate correctly causes loss of function but does not constitute a safety hazard)

☒ Class 3 (Non-critical SRD communication media whose failure to operate correctly causes loss of function which can be overcome by parallel means)

## 2.7. Measurement Uncertainty (95% confidence levels, k=2)

| Item | MU | Remark |
|---|---|---|
| Uncertainty for Power point Conducted Emissions Test | 2.42dB | |
| Uncertainty for Radiation Emission test in 3m chamber (30MHz to 1GHz) | 3.54dB | Polarize: V |
| | 4.1dB | Polarize: H |
| Uncertainty for Radiation Emission test in 3m chamber (1GHz to 25GHz) | 2.08dB | Polarize: H |
| | 2.56dB | Polarize: V |
| Uncertainty for radio frequency | 1×10-9 | |
| Uncertainty for conducted RF Power | 0.65dB | |
| Uncertainty for temperature | 0.2℃ | |
| Uncertainty for humidity | 1% | |
| Uncertainty for DC and low frequency voltages | 0.06% | |

## 2.8. Test Equipment

| Equipment | Manufacture | Model No. | Serial No. | Last cal. Due to | Cal Interval |
|---|---|---|---|---|---|
| 3m Semi-Anechoic | CHENYU | N/A | N/A | 2018.01.18 | 2Year |
| Spectrum analyzer | Agilent | E4407B | MY46185649 | 2017.01.16 | 1Year |
| Receiver | R&S | ESPI | 101873 | 2017.01.16 | 1Year |
| Receiver | R&S | ESCI | 101165 | 2017.01.16 | 1Year |
| Bilog Antenna | SCHWARZBECK | VULB 9168 | VULB9168-438 | 2018.01.18 | 2Year |
| Horn Antenna | SCHWARZBECK | BBHA 9120 D | BBHA 9120 D(1201) | 2017.01.20 | 2Year |
| Cable | Resenberger | N/A | No.1 | 2017.01.16 | 1Year |
| Cable | SCHWARZBECK | N/A | No.2 | 2017.01.16 | 1Year |
| Cable | SCHWARZBECK | N/A | No.3 | 2017.01.16 | 1Year |
| Pre-amplifier | HP | HP8347A | 2834A00455 | 2017.01.18 | 1Year |
| Pre-amplifier | Agilent | 8449B | 3008A02664 | 2017.01.18 | 1Year |
| vector Signal Generator | Agilent | N5182A | MY49060042 | 2016.11.16 | 1 Year |
| vector Signal Generator | Agilent | E4438C | US44271917 | 2016.11.16 | 1 Year |

| | | | | | |
|---|---|---|---|---|---|
| X-series USB Peak and Average Power Sensor | Agilent | U2021XA | MY54080020 | 2016.11.16 | 1 Year |
| X-series USB Peak and Average Power Sensor | Agilent | U2021XA | MY54110001 | 2016.11.16 | 1 Year |
| Signal Analyzer | Agilent | N9020A | MY48030494 | 2016.11.16 | 1 Year |

# 3. Transmitter Carrier Output Levels

## 3.1. Limit( ETSI EN 300 330-1V1.7.1 )

The maximum H-field strengths under normal and extreme conditions for certain frequency bands are given in table:

| Frequency range (MHz) | H-field strength limit ($H_f$) dBµA/m at 10 m |
|---|---|
| 0,009 ≤ f < 0,315 | 30 |
| 0,009 ≤ f < 0,03 | 72 or according to note 1 |
| 0,03 ≤ f < 0,05975<br>0,06025 ≤ f < 0,07<br>0,119 ≤ f < 0,135 | 72 at 0,03 MHz descending 3 dB/oct<br>or according to note 1 |
| 0,05975 ≤ f < 0,06025<br>0,07 ≤ f < 0,119<br>0,135 ≤ f < 0,140 | 42 |
| 0,140 ≤ f < 0,1485 | 37,7 |
| 0,1485 ≤ f < 30 | -5 (see note 4) |
| 0,315 ≤ f < 0,600 | -5 |
| 3,155≤ f < 3,400 | 13,5 |
| 7,400 ≤ f < 8,800 | 9 |
| 10,2 ≤ f < 11,00 | 9 |
| 6,765 ≤ f ≤ 6,795<br>13,553 ≤ f ≤ 13,567<br>26,957 ≤ f ≤ 27,283 | 42 (see note 3) |
| 13,553 ≤ f ≤ 13,567 | 60 (see notes 2 and 3) |
| NOTE 1: For the frequency ranges 9 to 70 kHz and 119 to 135 kHz, the following additional restrictions apply to limits above 42 dBµA/m:<br>- for loop coil antennas with an area ≥ 0,16 $m^2$ table 4 applies directly;<br>- for loop coil antennas with an area between 0,05 $m^2$ and 0,16 $m^2$ table 4 applies with a correction factor. The limit is: table value + 10 × log (area/0,16 $m^2$);<br>- for loop coil antennas with an area < 0,05 $m^2$ the limit is 10 dB below table 4.<br>NOTE 2: For RFID and EAS applications only.<br>NOTE 3: Spectrum mask limit, see annex G.<br>NOTE 4: For further information see annex H. | |

## 3.2. Test Procedure

EUT was placed on a 0.8 m outdoor wooden table. The search antenna is placed at 3m distances from the EUT and search antenna height is from 1-4m. With the transmitter operating at continuously mode, the turntable was slowly rotated to locate the direction of maximum emission. Once maximum direction is determined, the search antenna was raised and lowered in both vertical and horizontal polarizations.

The EUT was removed from the turntable and replaced with a linearly polarized antenna connected to a calibrated RF signal generator. The RF generator was set to a measured emission frequency and the search antenna was raised and lowered to produced a maximum received reading. The generator output was increased to match the radiated emission reading measured previously, and the result expressed in dB E.I.R.P. or ERP.

## 3.3. Test Result

| EUT: Fingerprint & RFID Time Attendance M/N:A300 | | | | |
|---|---|---|---|---|
| Test date: 2016-07-24 | | Test site: RF site | Tested by: Simple | |
| Test Conditions | | CH:125KHz (dBuA/m) | | Limit (dBuA/m,10m) |
| Temp | Volt | Value(3m) | Value(10m) | |
| 25℃ | 230 | 11.46 | -19.84 | 66.0 |
| | | 11.28 | -20.02 | |
| -10℃ | 207 | 11.35 | -19.95 | |
| -10℃ | 253 | 11.41 | -19.89 | |
| 50℃ | 207 | 11.29 | -20.01 | |
| 50℃ | 253 | 11.36 | -19.94 | |
| Conclusion: PASS | | | | |
| Note1: The measurement distance is 3m.<br>Note2: According to F.2 of EN 300 330-1, the correction factor between 10m and 3m at 125KHz should be 31.3dB. | | | | |

# 4. Permitted Frequency Range of the Modulation Bandwidth

## 4.1. Limit(ETSI EN 300 330-1V1.7.1)

The permitted rang of the modulation bandwidth shall be within 13.553-13.567MHz.

## 4.2. Test Procedure

1). The EUT was placed on a turn table which is 0.8m above ground plane.

2). The EUT was modulated by normal signal,

3). Set SPA Center Frequency = fundamental frequency, RBW=VBW= 100 Hz,

Span =500 Hz.

4), Both normal test condition and extreme test condition applied

## 4.3. Test Result

| EUT: Fingerprint & RFID Time Attendance M/N:A300 | | | | |
|---|---|---|---|---|
| Test date: 2016-07-24 | | Test site: RF site | Tested by: Simple | |
| Test Conditions | | CH:125KHz | | Limit (KHz) |
| Temp | Volt | FL | FH | |
| 25℃ | 230 | 123.56 | 127.38 | FL>119 FH<135 |
| -10℃ | 207 | 123.56 | 127.38 | |
| -10℃ | 253 | 123.56 | 127.38 | |
| 50℃ | 207 | 123.56 | 127.38 | |
| 50℃ | 253 | 123.56 | 127.38 | |
| Conclusion: PASS | | | | |

# 5. Transmitter Spurious Radiated Emission

## 5.1. Limit(ETSI EN 300 330-1V1.7.1)

The radiated field strength of the spurious domain emissions below 30 MHz shall not exceed the generated H-field dBμA/m at 10 m given in table:

| State | Frequency 9 kHz ≤ f < 10 MHz | Frequency 10 MHz ≤ f < 30 MHz |
|---|---|---|
| Operating | 27 dBμA/m at 9 kHz descending 3 dB/oct | -3,5 dBμA/m |
| Standby | 5,5 dBμA/m at 9 kHz descending 3 dB/oct | -22 dBμA/m |

The power of any radiated emission shall not exceed the values given in table :

| State | 47 MHz to 74 MHz<br>87,5 MHz to 118 MHz<br>174 MHz to 230 MHz<br>470 MHz to 862 MHz | Other frequencies between<br>30 MHz to 1 000 MHz |
|---|---|---|
| Operating | 4 nW | 250 nW |
| Standby | 2 nW | 2 nW |

## 5.2. Test Procedure

1, The EUT was placed on a 1.5m high table in the chamber and turned on in continuously TX mode.

2, All the spurious emissions at 3m distance was measured and recorded with receive antenna in both vertical and horizontal by rotating the turntable and by lowering the receive antenna, and the spectrum analyser was set as below

RBW:100KHz

VBW:30KHz

Detector mode: PK mode

Sweep time: Auto

For measuring emissions that exceed the level of 6dB below the applicable limit,the resolution bandwidth shall be switched to 30KHz and the span shall be adjusted accordingly.If the level does not change by more than 2dB,it is a narrowband emissions, if the level changes by more than 2dB, the emission is a wideband emission.

3, The EUT was then removed and replaced with a substitution antenna in the same position and the substitution antenna must have the same polarization with the receive antenna.

4, A signal which have the same frequency obtained in step 2 was fed to the substitution antenna ,the receive antenna was raised and lowered to obtain a maximum reading at the test receiver, the level of the signal generator was adjusted until the measured field strength level in step 2 was obtained, recorded the level of the signal generator.

5, Repeated step 4 with both antenna polarizations

6, The spurious emissions is equal to the power supplied by the signal generator and corrections due to the gain of the substitution antenna and the cable loss between the signal generator and the substitution antenna.

## 5.3. Test Result

| EUT: Fingerprint & RFID Time Attendance M/N: A300 | | | | | |
|---|---|---|---|---|---|
| Test Date: 2016-07-24 | Test site: RF Site | | Tested by: simple | | |
| Ambient Temperature: 23℃ | Relative Humidity: 60% | | | | |
| Test result 9KHz-30MHz | | | | | |
| Test Mode： 125KHzz | | | | | |
| Frequency (MHz) | Antenna polarization | Result (dBm) | Limit (dBm) | Margin (dB) | Conclusion |
| ----- | H | ----- | 27 dBuA/m at 9KHz descending 3dB/oct (9KHz – 10MHz) | ----- | ----- |
| ----- | H | ----- | | ----- | ----- |
| ----- | H | ----- | | ----- | ----- |
| ----- | H | ----- | -3.5 dBuA/m (10MHz – 30MHz) | ----- | ----- |
| ----- | H | ----- | | ----- | ----- |
| ----- | H | ----- | | ----- | ----- |
| | | | | | |
| ----- | V | ----- | 27 dBuA/m at 9KHz descending 3dB/oct (9KHz – 10MHz) | ----- | ----- |
| ----- | V | ----- | | ----- | ----- |
| ----- | V | ----- | | ----- | ----- |
| ----- | V | ----- | -3.5 dBuA/m (10MHz – 30MHz) | ----- | ----- |
| ----- | V | ----- | | ----- | ----- |
| ----- | V | ----- | | ----- | ----- |
| NOTE: Data of measurement within this frequency range shown " -- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured. | | | | | |

| EUT: Fingerprint & RFID Time Attendance M/N: A300 | | | | | |
|---|---|---|---|---|---|
| Test Date: 2016-07-24 | | Test site: RF Site | | Tested by: simple | |
| Ambient Temperature: 23℃ | | Relative Humidity: 60% | | | |
| Test result 30MHz-1GHz | | | | | |
| Test Mode：125KHzz | | | | | |
| Frequency (MHz) | Antenna polarization | Result (dBm) | Limit (dBm) | Margin (dB) | Conclusion |
| 174.63 | H | -64.72 | -54.00 | -10.72 | PASS |
| 182.39 | H | -65.83 | -54.00 | -11.83 | PASS |
| 273.47 | H | -64.37 | -36.00 | -28.37 | PASS |
| 436.58 | H | -62.46 | -36.00 | -26.46 | PASS |
| 581.27 | H | -67.63 | -54.00 | -13.63 | PASS |
| 753.34 | H | -65.35 | -54.00 | -11.35 | PASS |
| | | | | | |
| 249.62 | V | -63.65 | -36.00 | -27.65 | PASS |
| 371.84 | V | -64.72 | -36.00 | -28.72 | PASS |
| 453.57 | V | -63.29 | -36.00 | -27.29 | PASS |
| 482.71 | V | -65.53 | -54.00 | -11.53 | PASS |
| 509.14 | V | -65.39 | -54.00 | -11.39 | PASS |
| 636.28 | V | -66.91 | -54.00 | -12.91 | PASS |

# 6. Duty Cycle (RFID)

## 6.1. Limit(ETSI EN 300 330-1V1.7.1)

In a period of 1 hour the duty cycle shall not exceed the values given in table:

| Duty cycle Class | Duty cycle ratio |
|---|---|
| 1 | < 0,1 % |
| 2 | < 1,0 % |
| 3 | < 10 % |
| 4 | Up to 100 % |

## 6.2. Test Procedure

1). The EUT was placed on a turn table which is 0.8m above ground plane.

2). The EUT was modulated by normal signal,

3). Set SPA Center Frequency = fundamental frequency, RBW=VBW= 470 Hz, Span =0 Hz, Sweep Time=80.82ms

4). Record the on time and off time

## 6.3. Test Result

The EUT is declared by manufacturer as a duty cycle ratio of up to 100%.

# 7. Receiver Spurious Radiated Emission

## 7.1. Limit(ETSI EN 300 330-1V1.7.1)

The spurious components below 30 MHz shall not exceed the generated H-field dBμA/m values at 10 m according to table

| Frequency 9 kHz ≤ f < 10 MHz | Frequency 10 MHz ≤ f < 30 MHz |
|---|---|
| 5.5 dBμA/m at 9 kHz descending 3 dB/oct | -22 dBμA/m |

## 7.2. Test Procedure

1, The EUT was placed on a 1.5m high table in the chamber and turned on in continuously TX mode.

2, All the spurious emissions at 3m distance was measured and recorded with receive antenna in both vertical and horizontal by rotating the turntable and by lowering the receive antenna, and the spectrum analyser was set as below

RBW:100KHz; VBW:30KHz; Detector mode: PK mode; Sweep time: Auto

For measuring emissions that exceed the level of 6dB below the applicable limit,the resolution bandwidth shall be switched to 30KHz and the span shall be adjusted accordingly.If the level does not change by more than 2dB,it is a narrowband emissions, if the level changes by more than 2dB, the emission is a wideband emission.

3, The EUT was then removed and replaced with a substitution antenna in the same position and the substitution antenna must have the same polarization with the receive antenna.

4, A signal which have the same frequency obtained in step 2 was fed to the substitution antenna ,the receive antenna was raised and lowered to obtain a maximum reading at the test receiver, the level of the signal generator was adjusted until the measured field strength level in step 2 was obtained, recorded the level of the signal generator.

5, Repeated step 4 with both antenna polarizations

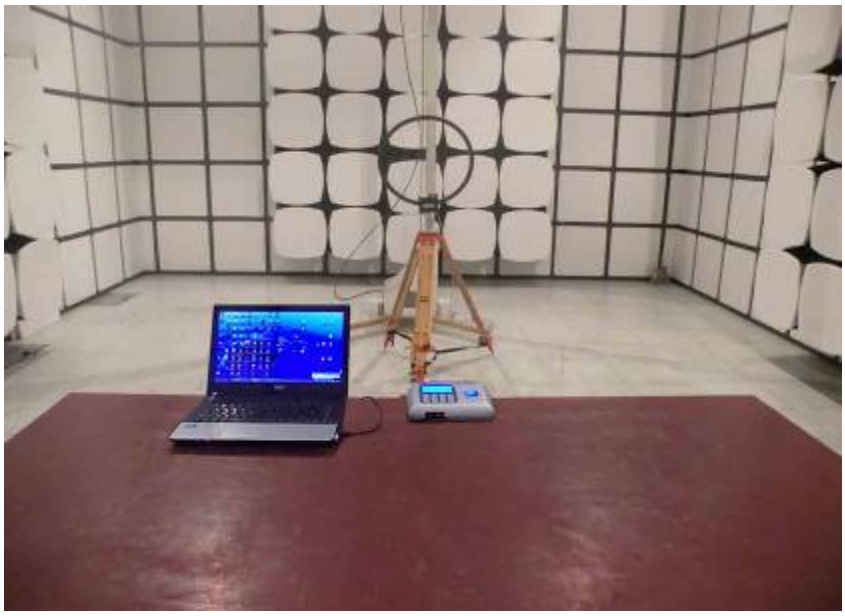
6, The spurious emissions is equal to the power supplied by the signal generator and corrections due to the gain of the substitution antenna and the cable loss between the signal generator and the substitution antenna.

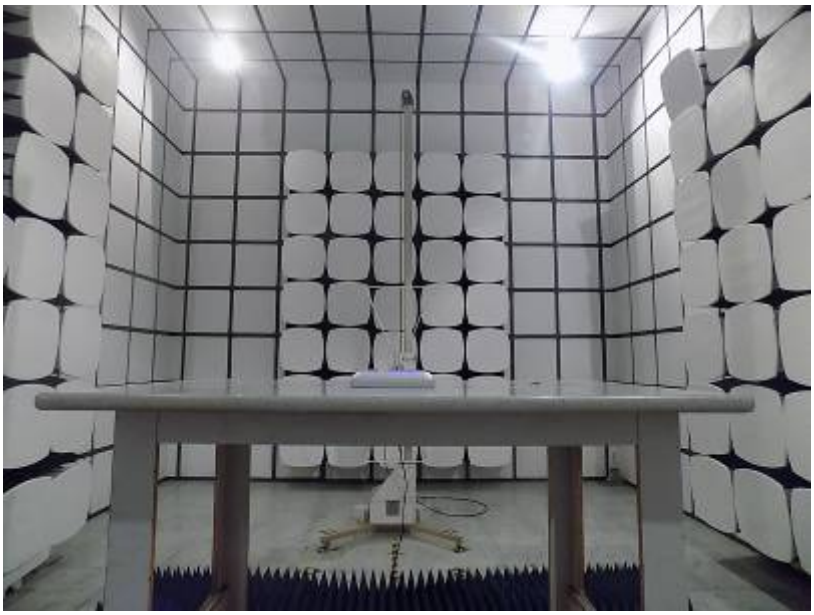
## 7.3. Test Result

These requirements do not apply to receives used in combination with permanently co-located transmitters continuously transmitting. Co-located is defined as < 3m. in these case the receivers will be tested together with the transmitter in operating mode.

The transmitter and receiver of sample must locate with 3m. therefore, the receiver is tested with the transmitter in operation mode. The test result refers to chapter 11.

# 8. Photos of Setup

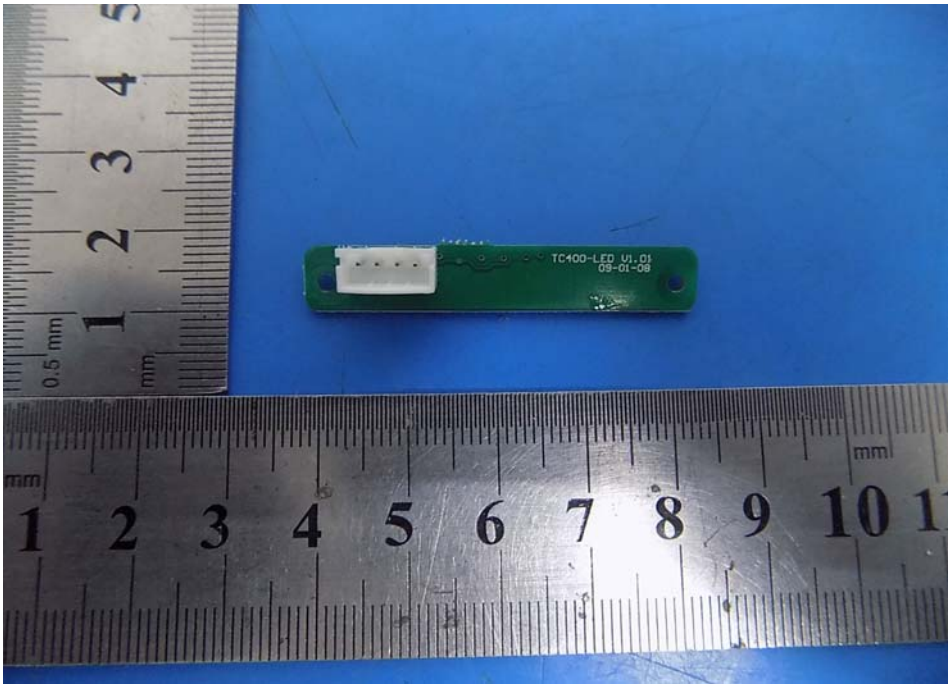




# 9. Photos of EUT



ANVIZ
FINGERPRINT EMPLOYEE TIME CLOCK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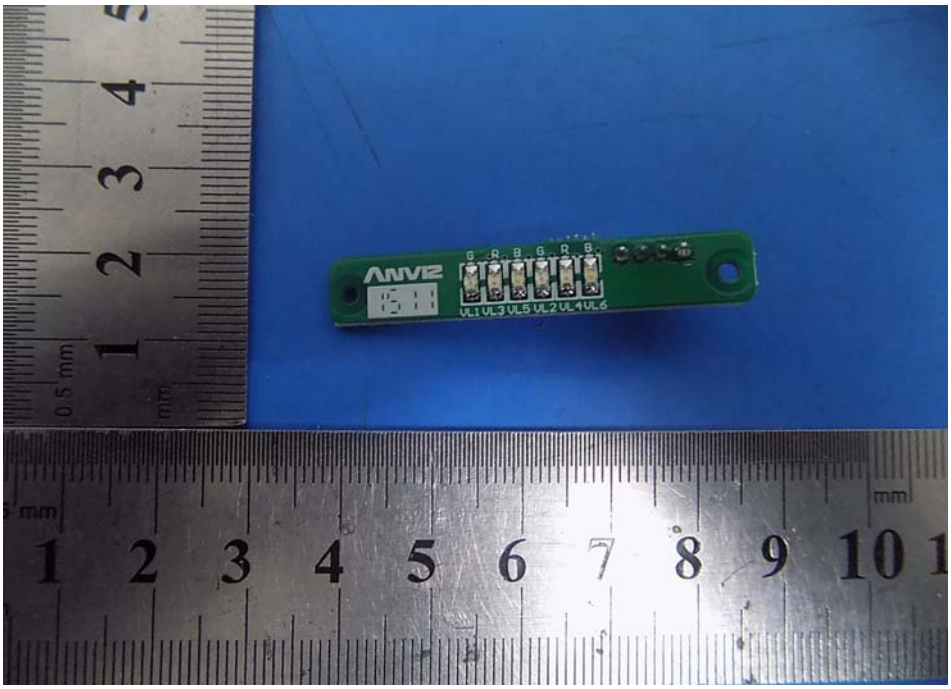
ANV2
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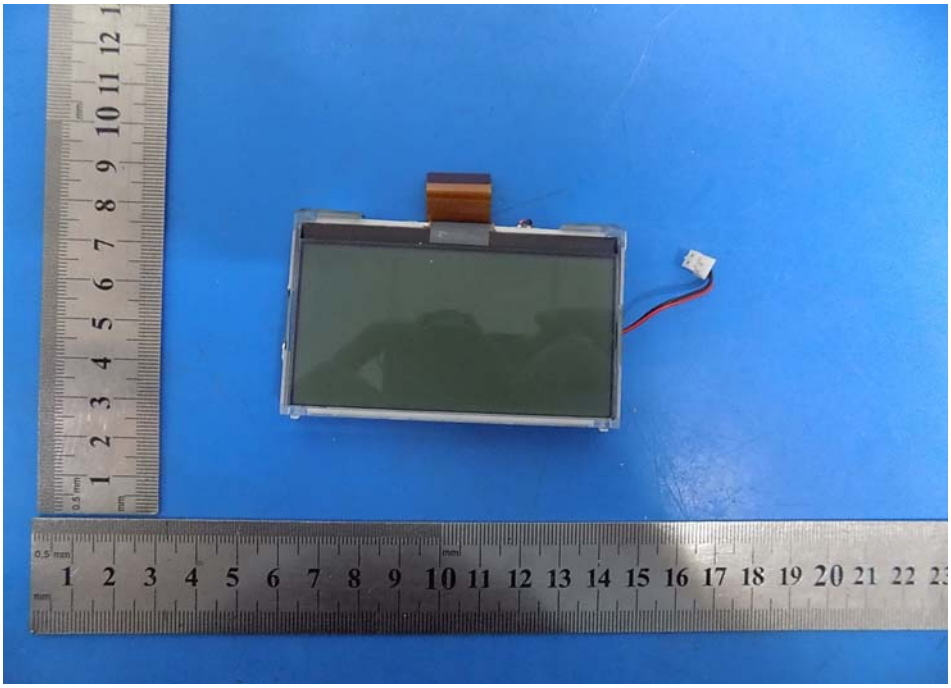
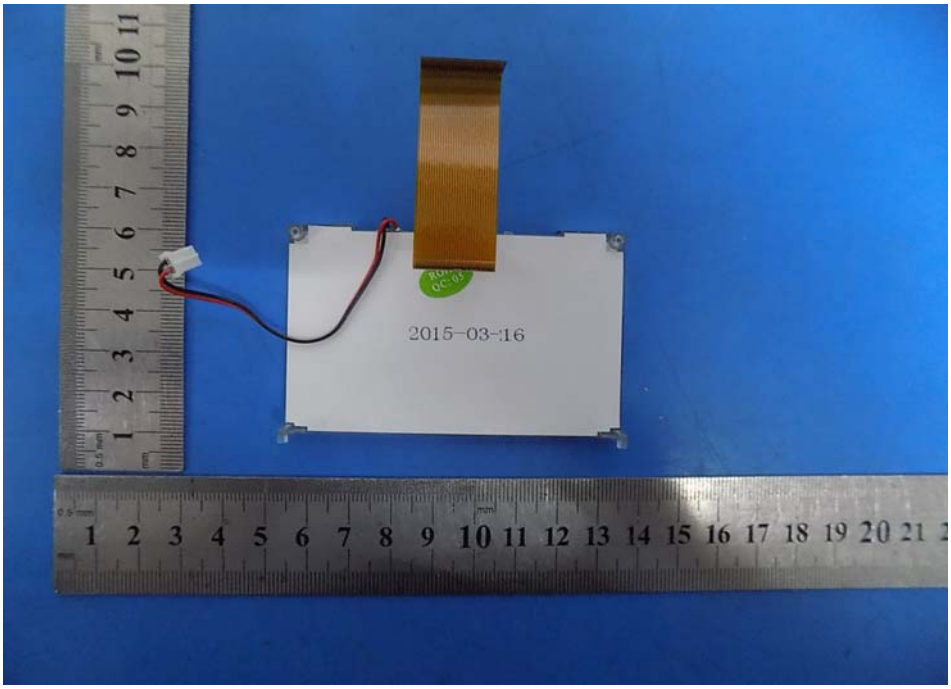
VL1 VL3 VL5 VL2 VL4 VL6

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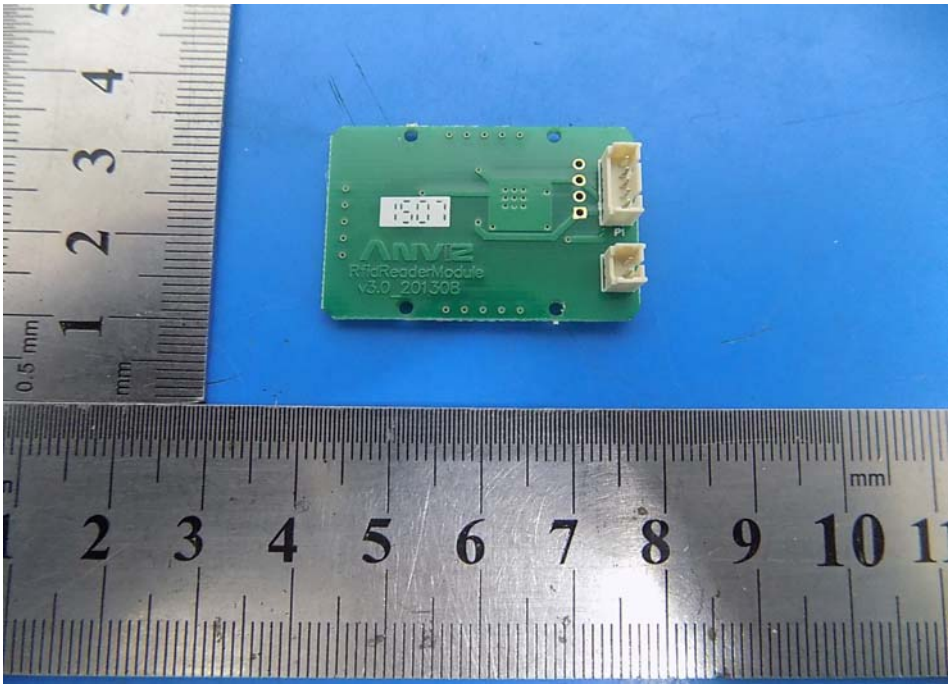
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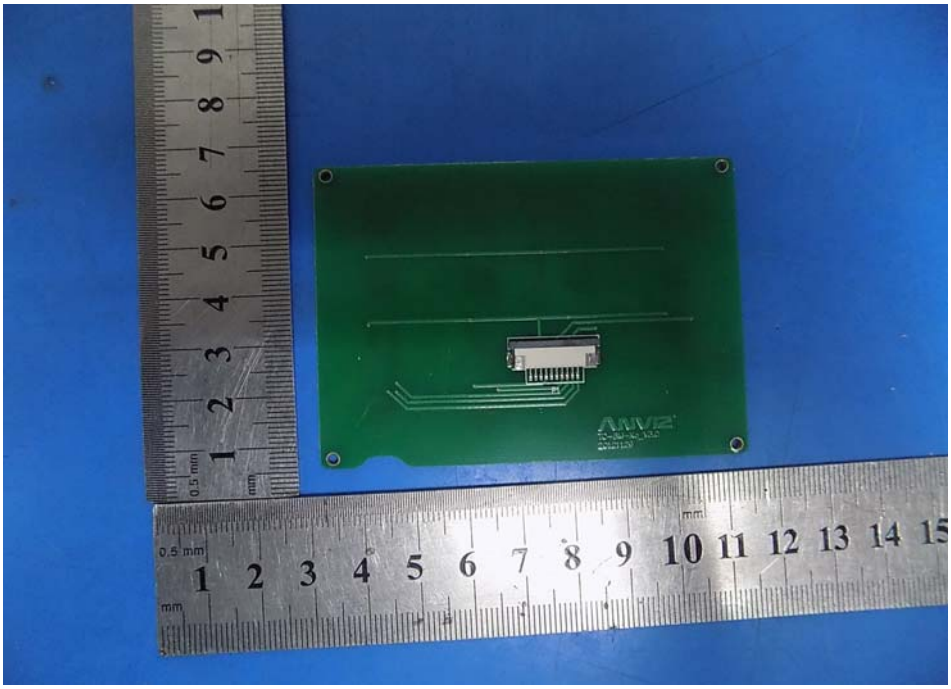
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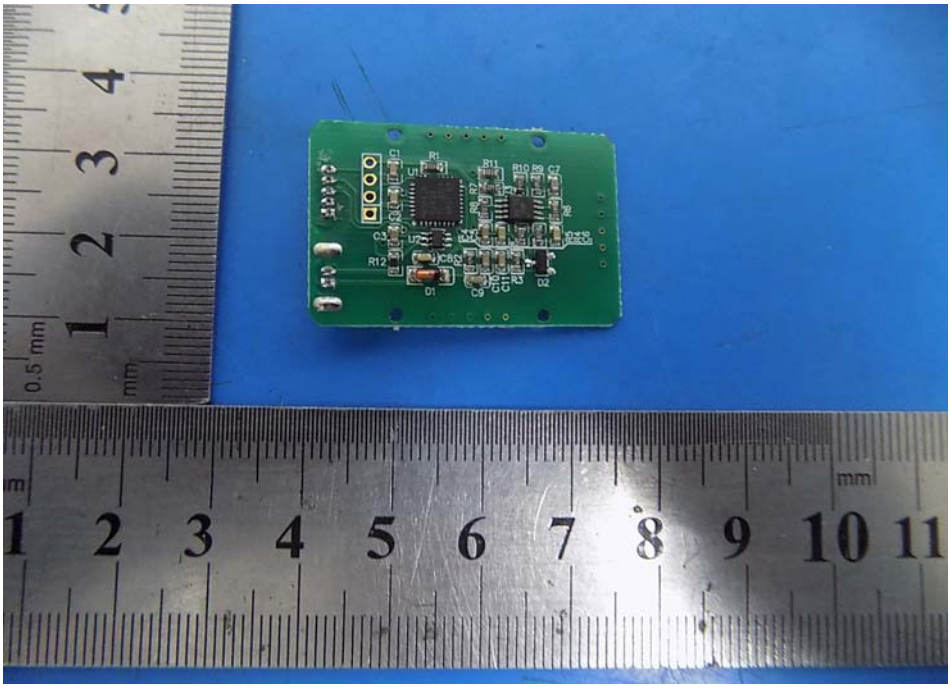
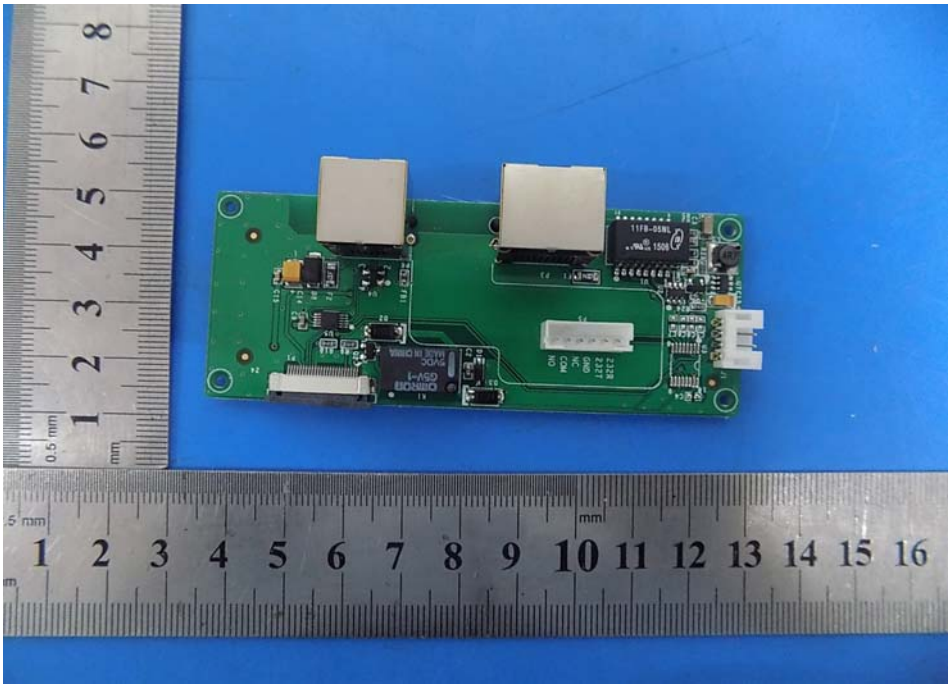
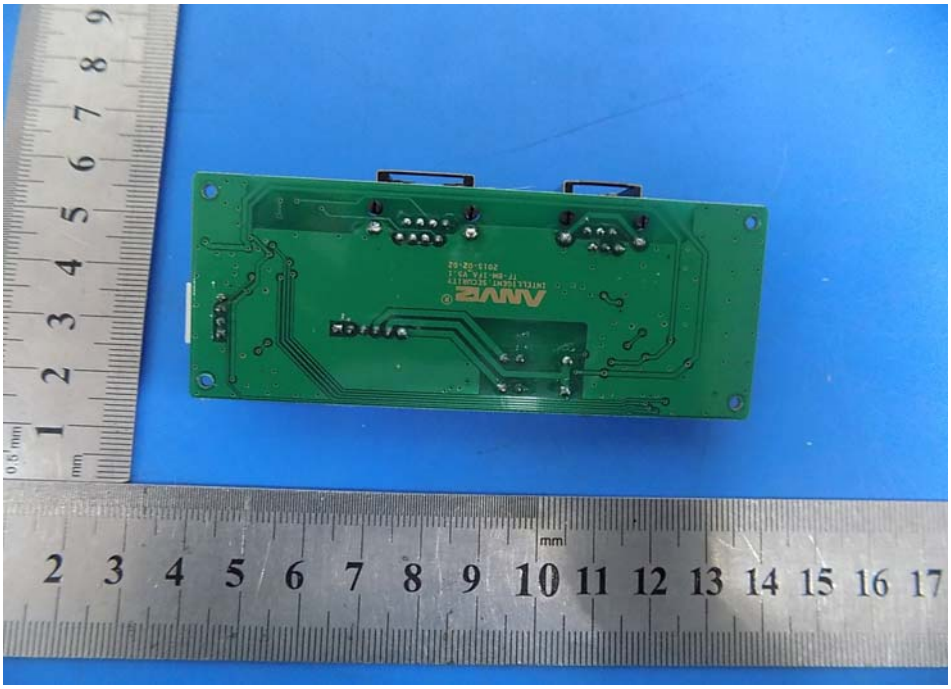
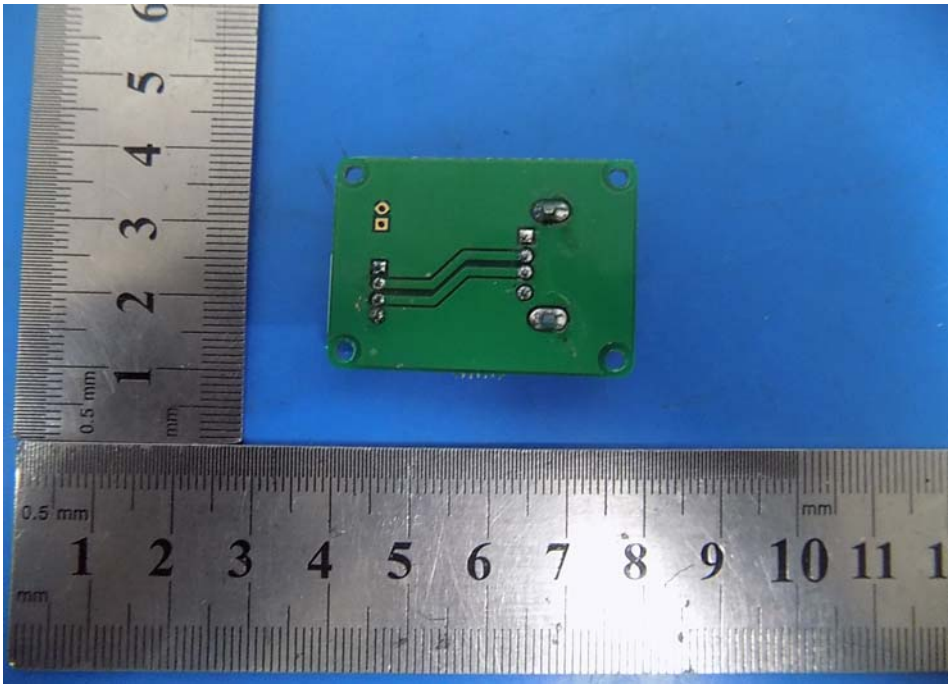
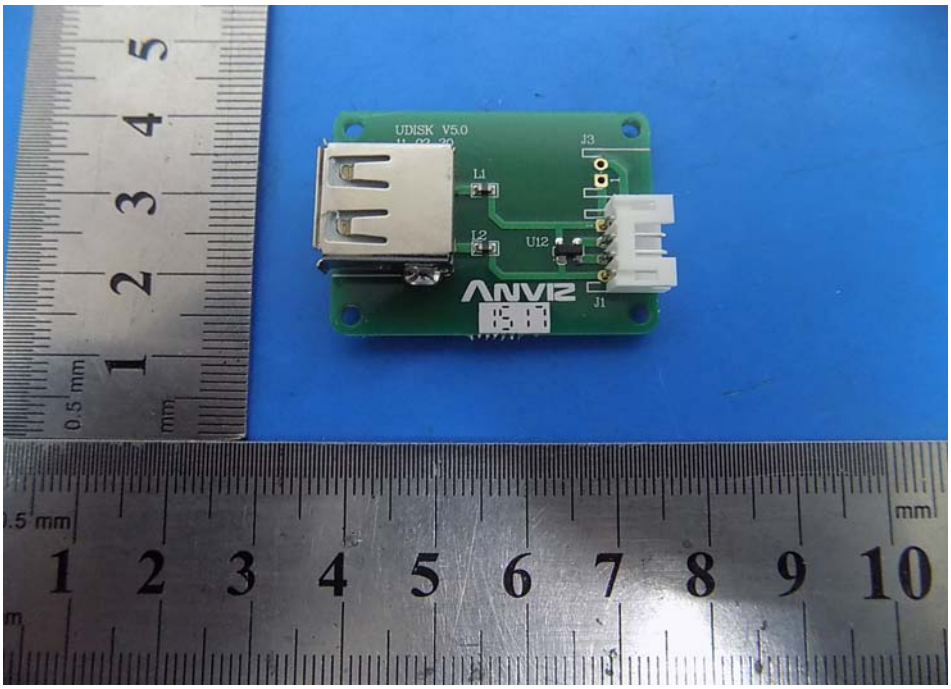


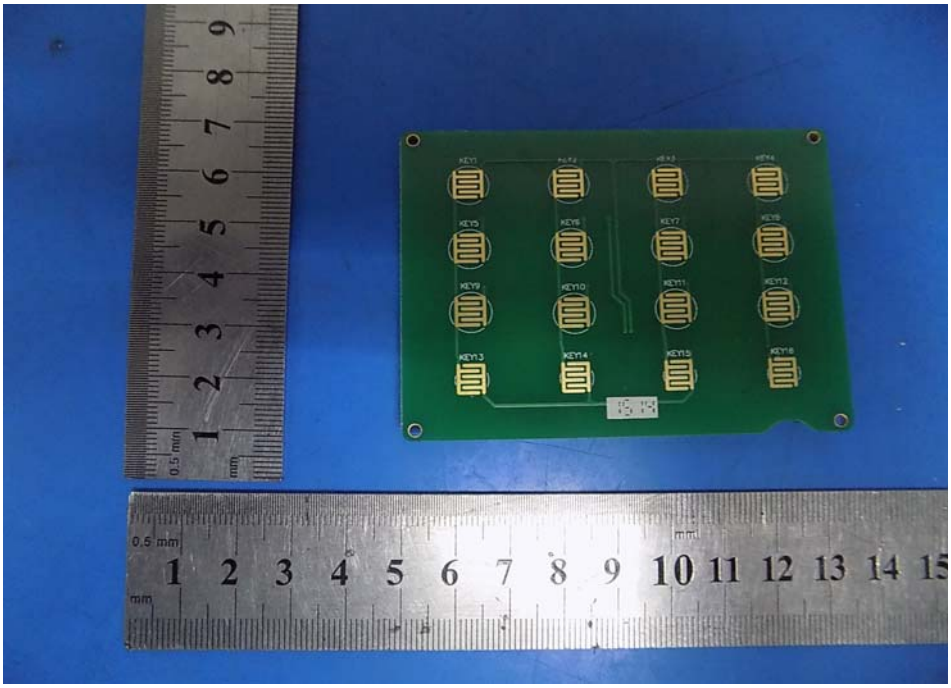

ANVIZ

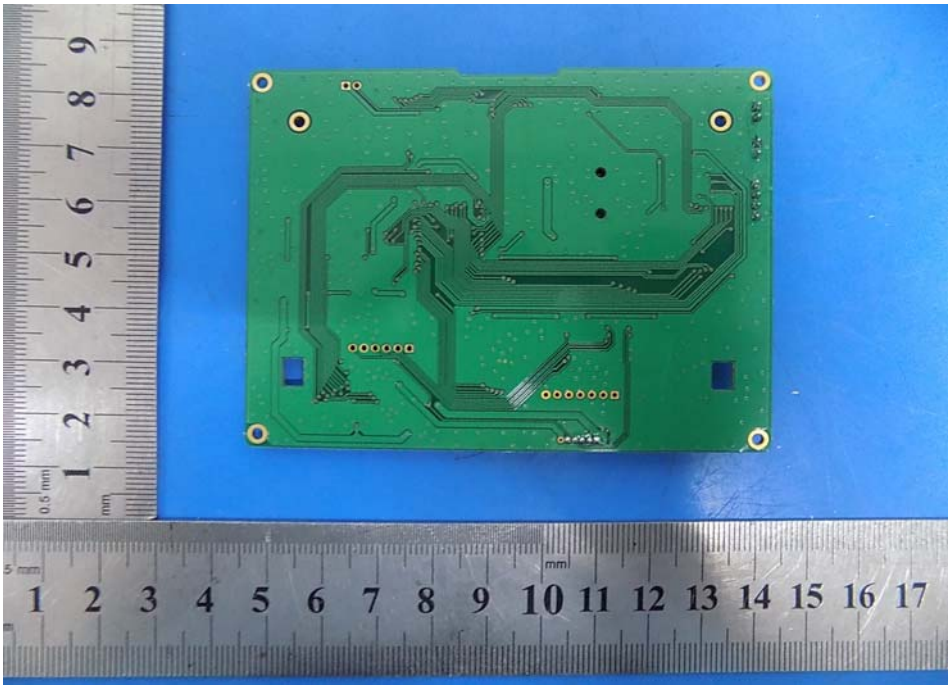


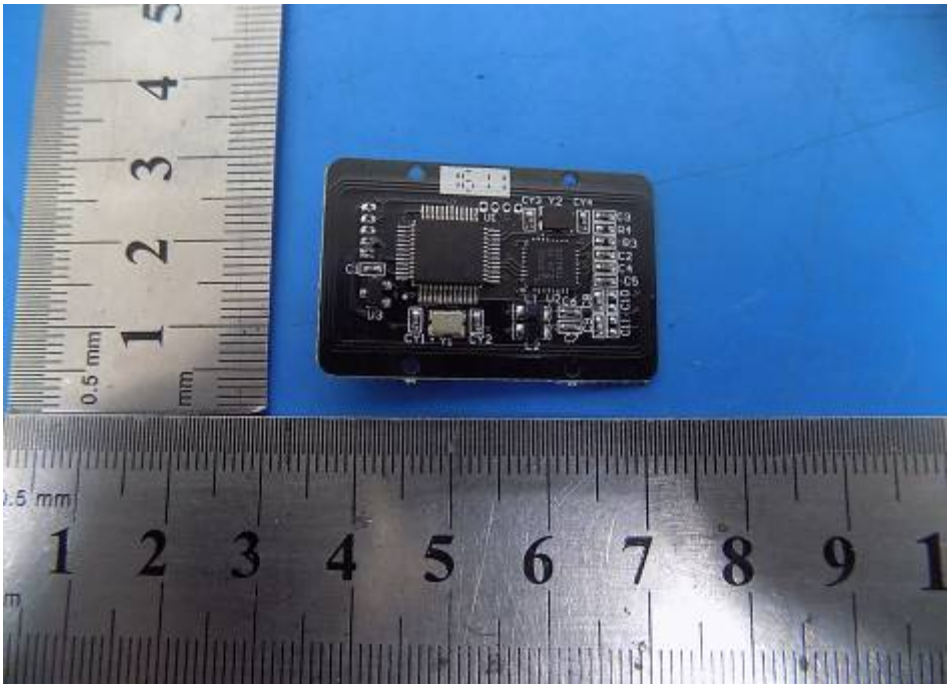


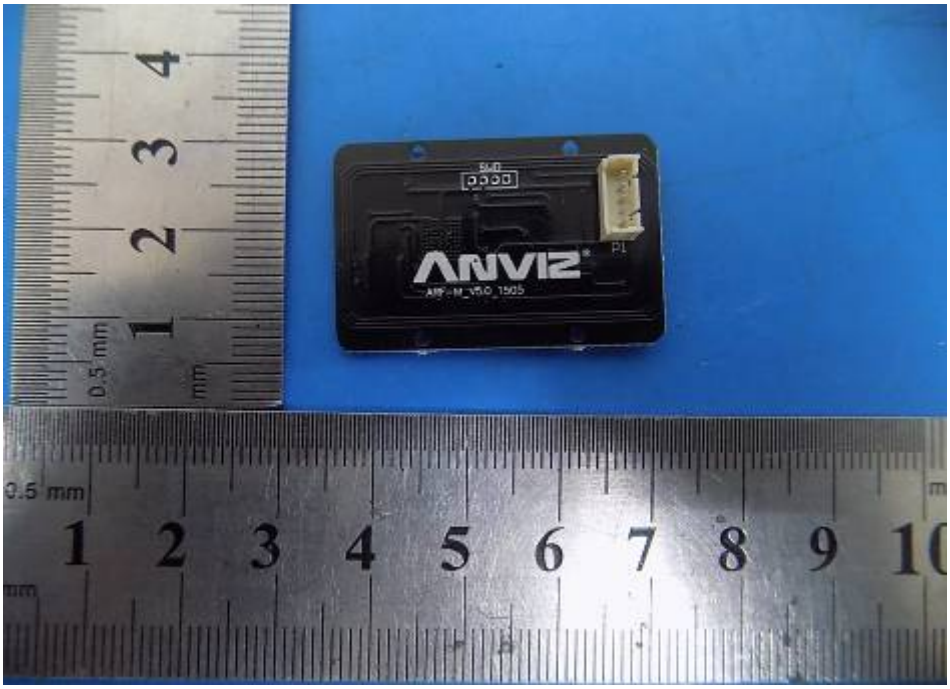



UDISK V5.0
J3
L1
L2
U12
J1
ANVI2


KEY1
KEY2
KEY3
KEY4
KEY5
KEY6
KEY7
KEY8
KEY9
KEY10
KEY11
KEY12
KEY13
KEY14
KEY15
KEY16
0.5 mm
mm
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15


0.5 mm
mm
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17






**-------END OF THE REPORT-------**