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**Applicant** Shanghai MXCHIP Information Technology Co.,Ltd

**Address** 9th Floor, No.5, Lane 2145 JinshaJiang Road, Putuo District,

Shanghai

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

of the client

Sample name EMB1061(EMB1061-P/EMB1061-E)

Manufacturer Shanghai MXCHIP Information Technology Co., Ltd

**Country of Destination** Europe, U.S.A, Other

**Country of Origin** China

Aug. 09, 2018 Sample received date

**Testing period** Aug. 09, 2018 to Aug. 16, 2018

1. As specified by client, to screen Lead(Pb), Cadmium(Cd), Test requested

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 in accordance with the RoHS Directive

2011/65/EU.

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 in accordance with the RoHS Directive 2011/65/EU and amendment Commission Delegated

Directive (EU) 2015/863 with effective from 22 July 2019.

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

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

Test engineer

Reviewed by / M

Test engineer

Leo Li Authorized signatory

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#### **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                    | MDL                                     |          |                |
|---------|---|---|----------|----------------|
|         | Polymers and metals                     | Composite material                      | Polymers | Other material |
| Pb      | BL≤(700-3σ) <x <(1300+3σ)<br="">≤OL</x> | BL≤(500-3σ) <x <(1500+3σ)<br="">≤OL</x> | 10 mg/kg | 50 mg/kg       |
| Cd      | BL≤(70-3σ) <x <(130+3σ)<br="">≤OL</x>   | LOD≤(50-3σ) <x <(150+3σ)<br="">≤OL</x>  | 10 mg/kg | 50 mg/kg       |
| Hg      | BL≤(700-3σ) <x <(1300+3σ)<br="">≤OL</x> | BL≤(500-3σ) <x <(1500+3σ)<br="">≤OL</x> | 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
- $-3\sigma$ = The reproducibility of analytical instruments
- -LOD= Detection limit

#### **B. Chemical Test**

| Test Item(s)                              | Test Method                | Measured<br>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+AMD1:2017 | ICP-OES                  | 2 mg/kg  | 1000 mg/kg |
| 11  | IEC 62321-7-1:2015 Ed.1.0  | UV-VIS                   | And      | 1000 mg/kg |
| Hexavalent Chromium Cr(VI)                | IEC 62321-7-2:2017 Ed.1.0  | 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<br>Ethers (PBDEs) | IEC 62321-6:2015 Ed.1.0    | GC-MS                    | 5 mg/kg  | 1000 mg/kg |
| Phthalates                                | IEC 62321-8:2017 Ed.1.0    | GC-MS                    | 50 mg/kg | 1000 mg/kg |



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### **Test Results:**

| Sample<br>No.   | Sample<br>Description       | Tested Items   | XRF Screening Test<br>Unit (mg/kg) | Chemical Test<br>Unit (mg/kg) | Conclusion |
|-----------------|-----------------------------|----------------|------------------------------------|-------------------------------|------------|
| *ek             | abotek Anbo                 | Pb             | Opotek BLOO                        | hotel Anb                     | View Vuln  |
| 1 Soldering tin | Cd                          | botek BL Anboy | Am lek                             | ipotek Aup                    |            |
|                 | Hg.nbotek                   | note BL Notes  | Kup                                | PASS                          |            |
|                 | Anbo                        | Cr(Cr(VI))     | BL BL                              | M. M. Do                      | VII.       |
|                 | Jok Aupor                   | Br(PBBs&PBDEs) | Mula I ak                          | otek Anbore                   | And        |
| ek b.           | Potek Aupole.               | Pb             | ISK MBL                            | otek / vupotek                | Anbo       |
|                 | arek kupor                  | Cd             | LOD                                | rup sekl abo                  | ek Aupore  |
| 2               | IC                          | Hg             | BL boten                           | Aupo /k                       | PASS       |
|                 | Anbor All                   | Cr(Cr(VI))     | And BL Botek                       | Aupol An                      | Yok        |
|                 | Anbore                      | Br(PBBs&PBDEs) | Anbo BL An oto                     | 4 Andores                     | Anbo R.    |
| P.11.           | ek Vupoter                  | Anbo Apotek    | Anbor BL And                       | rek labotek                   | Aupo       |
|                 | yek hotek                   | Cd             | LOD                                | L hotek                       | Anbote     |
| 3 1             | Chip capacitor              | Hg And         | BLotek A                           | upor / Am                     | PASS       |
|                 | Anbore Ans                  | Cr(Cr(VI))     | BL otek                            | Aupose, / Yun                 | toda Yes   |
|                 | Vuposer Vup.                | Br(PBBs&PBDEs) | Anbott BLAnning                    | nbote Ant                     | o. bi.     |
| un Jek          | Vipolok V                   | Pb             | Anboten BL Anbe                    | Jeek 1                        | upose Yu.  |
|                 | Connert motel               | Cd             | nboteBL Anbo                       | -k hotek                      | Anboyen    |
| 4 nbox          | Coppery metal contact plate | Anbote Hg Anbe | BL Anbo                            | Pro tok                       | PASS       |
|                 | Contact plate               | Cr(Cr(VI))     | BL                                 | ootek / Anbo                  | k. botek   |
| Yek.            | nbotek Anbo                 | Br(PBBs&PBDEs) | ore. Any                           | abotek / Anbote               | V VV       |
|                 | botek Anbo                  | Pb             | Thotek Bropo                       | Anbey Anbe                    | te. Vub.   |
|                 | Au Potok Pu                 | Cd             | LOD                                | Au Tek                        | potek Aup  |
| 5               | Blue PCB                    | Hg noo         | Note BL Anbore                     | Anbo                          | PASS       |
| k Pupots        | Aupo                        | Cr(Cr(VI))     | BL abou                            | N POLY                        | An         |
|                 | Jok Wipose                  | Br(PBBs&PBDEs) | X X                                | N.D.                          | And        |
| , o o o o       | Posek Vupose.               | Pb             | ION AUBL                           | Lotek   Anbotek               | Aupo       |
|                 | otek Anbote                 | Cd             | Motok Brooks                       | tekl abo                      | ek Aupore  |
|                 | Crystal oscillator          | Hg             | New BL nboken                      | Anbo                          | PASS       |
|                 | Yupo, Yu                    | Cr(Cr(VI))     | And BL Potok                       | Anbol An                      | Nek .n     |
|                 | Au Anbolek                  | Br(PBBs&PBDEs) | Aupo, I Will                       | e Notes                       | Aupo -K    |



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| Sample<br>No.               | Sample<br>Description | Tested Items       | XRF Screening Test<br>Unit (mg/kg) | Chemical Test<br>Unit (mg/kg) | Conclusion |
|-----------------------------|-----------------------|--------------------|------------------------------------|-------------------------------|------------|
| 7 White label               | nbotes Anbo           | Pb <sup>V</sup> An | BL                                 | upotek / Aupot                | Al.        |
|                             |                       | Cd                 | upoten BLup                        | hotely And                    | re. And    |
|                             | White label           | Hg                 | BL Anbo                            | VIII VEK                      | PASS       |
|                             |                       | Cr(Cr(VI))         | Total BL Mapore                    | Kup. I **                     | Polek      |
| Anbore                      | nbote Anbo            | Br(PBBs&PBDEs)     | BL BL                              | PADO.                         | All        |
| Silvery metal contact plate | hotek Anbotek         | Pb kaboke          | BL W                               | otek Anbore                   | Vun.       |
|                             |                       | Cd                 | A BL                               | TOTAL I VUPOSE,               | Aupo       |
|                             | 10°                   | Hg                 | BLook                              | 10K1 000                      | PASS       |
|                             | Cr(Cr(VI))            | BL boten           | Vupo 1k                            | otek Anbe                     |            |
| abotek                      | Vupor Vu              | Br(PBBs&PBDEs)     | Yup Pak I Polsk                    | Aupol A                       | 1ek        |

#### Test Result(s):

| Tested Item(s)                                 | botek Anb         | Result<br>Unit (mg/kg) |               | Anbotek An |  |
|--|-------------------|------------------------|---------------|------------|--|
| potek Anbotek Anbo                             | Anbo'2 A          | nbores 3 Amb           | tek 5 Anbotek | Anbore     |  |
| Di-isobutyl phthalate(DIBP) CAS #:84-69-5      | N.D.              | N.D.                   | N.D.          | N.D.       |  |
| Dibutyl phthalate(DBP) CAS #:84-74-2           | otek N.D. Anbotek | 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.       |  |

#### Note:

- 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.
- -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<sup>2</sup>.





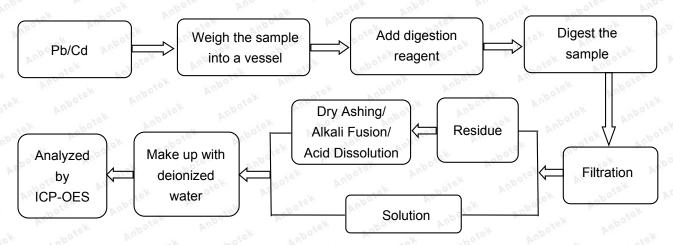


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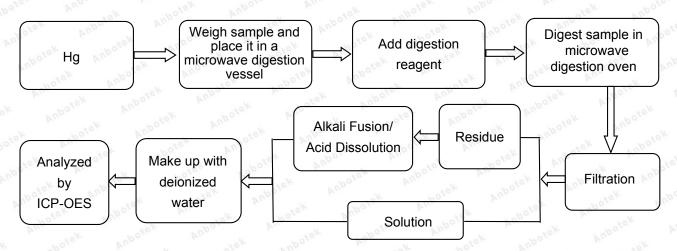
#### **Test Process:**

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

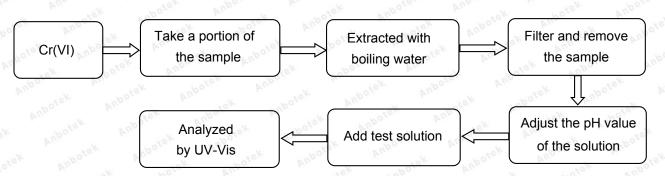
#### ♦ IEC 62321-5:2013 Ed.1.0



#### ♦ IEC 62321-4:2013+AMD1:2017



#### ♦ IEC 62321-7-1:2015 Ed.1.0



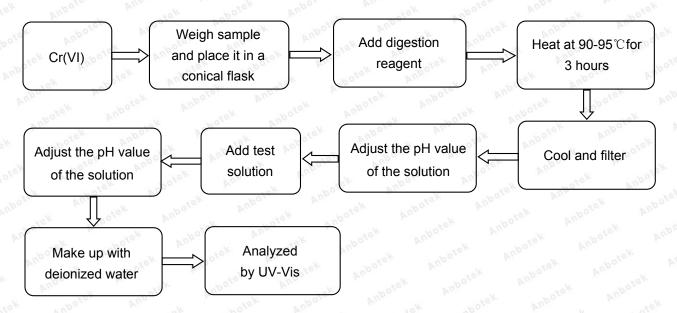
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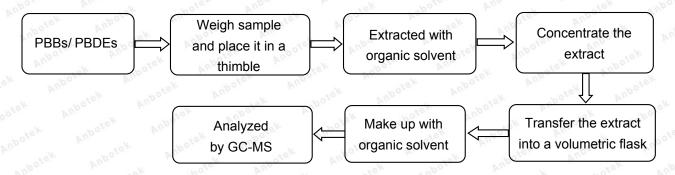


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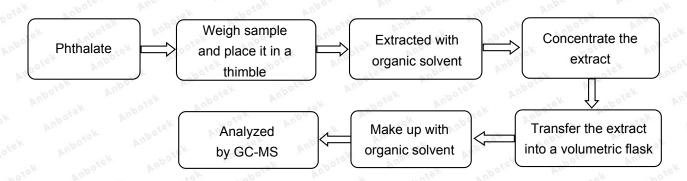
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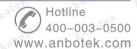
#### ♦ IEC 62321-6:2015 Ed.1.0



### ♦ IEC 62321-8:2017 Ed.1.0



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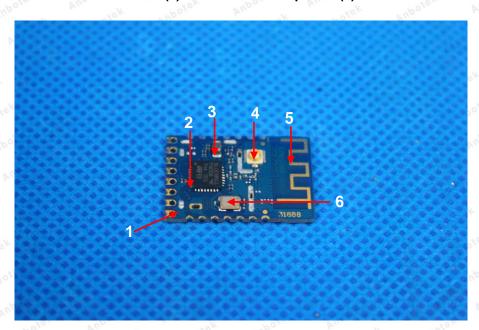
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### **Photograph of Sample**

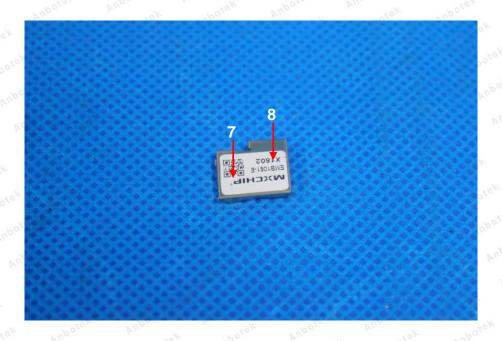


Photo(s) of the tested component(s)





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

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