

Specification for Approval

Date: 2024/11/26

| | Haloge |
|-------------|----------|
| Customer: | Halogen- |
| Oustonier . | Halog |

CPI201210UV-1R0M-1A0

| | CUSTOMER P/N: | | | |
|------|---------------|------------------------|----------|--|
| | DESCRIPTION: | | | |
| | QUANTITY: | рс | <u>s</u> | |
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西北臺慶科技股份有限公司 TAI-TECH Advanced Electronics Co., Ltd

□西北臺慶科技股份有限公司

TAI-TECH Advanced Electronics Co., Ltd

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Sales Dep.

| APPROVED | CHECKED |
|------------------|---------|
| 管哲頎 Eric Guan | 蒯青榮 |

R&D Center

| APPROVED | APPROVED CHECKED | | |
|----------|------------------|-----|--|
| 鄧福興 | 浦冬生 | 王俞琴 | |

 TAI-TECH
 KBM01-241100884
 P1

High Current Ferrite Chip Inductor (Lead Free)

CPI201210UV-1R0M-1A0

| | ECN HISTORY LIST | | | | | | |
|-----|------------------|---------------------------------|----------|---------|-------|--|--|
| REV | DATE | DESCRIPTION | APPROVED | CHECKED | DRAWN | | |
| 1.0 | 20/04/20 | 新版發行 | 鄧福興 | 浦冬生 | 王俞琴 | | |
| 2.0 | 20/08/01 | 更新 Reflow 依 IPC EDEC J-STD-020E | 鄧福興 | 浦冬生 | 王俞琴 | | |
| 3.0 | 22/12/05 | 更新可靠度及更正 Reflow 敘述 | 鄧福興 | 浦冬生 | 王俞琴 | | |
| 4.0 | 23/12/01 | 可靠度全面修訂為 REV E 版本 | 鄧福興 | 浦冬生 | 王俞琴 | | |
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High Current Ferrite Chip Inductor (Lead Free)

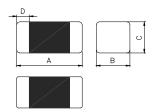
CPI201210UV-1R0M-1A0

1. Features

1. 2.0x1.25 mm and 1.0 mm in height (very compact size): CAE and fine printing technology made this compact size possible

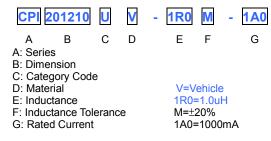
- 2. Stable minimum DC resistance in the class.
- 3. High speed mounting: Using SMT mounter makes less than a second mounting possible.
- 4. Excellent mounting strength by SMD chip making.
- Reduced noise over 2/3 of coil inductor by optimal design of CAD Completely lead-free product and support lead-free solder.
- 6. Operating Temperature:-55~+125°C (Including self-temperature rise)
- 7.AEC-Q200

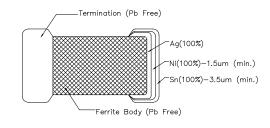
2. Dimensions



| Chip Size | | | | | |
|--------------------------------|---------|----------|----------|---------|--|
| Series A(mm) B(mm) C(mm) D(mm) | | | | | |
| 201210 | 2.0±0.2 | 1.25±0.2 | 1.0 max. | 0.5±0.3 | |

3. Part Numbering

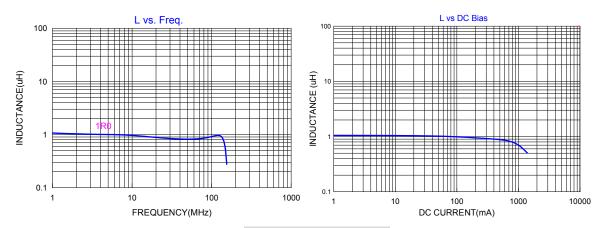




4. Specification

| Tai-Tech | Inductance(uH) | Test Frequency | est Frequency Rated Current | | DCR (Ω) | |
|----------------------|----------------|----------------|-----------------------------|------|---------|--|
| Part Number | inductance(un) | (Hz) | (mA) max. | max. | typ. | |
| CPI201210UV-1R0M-1A0 | 1.0±20% | 1M / 60mV | 1000 | 0.14 | 0.11 | |

- Rated current: based on temperature rise test
- In compliance with EIA 595
- - Inductance-Frequency Characteristics
- Inductance VS DC Bias Current



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 KBM01-241100884
 P3

5. Reliability and Test Condition

| Item | Performance | Test Condition |
|---------------------------------------|--|---|
| Series No. | СРІ | |
| Operating Temperature | -55~+125℃ (Including self-temperature rise) | |
| Transportation Storage Temperature | -55~+125℃ (on board) | For long storage conditions, please see the Application Notice |
| Inductance (Ls) | | Agilent4291 Agilent E4991 |
| Q Factor | | Agilent4287 Agilent16192 |
| DC Resistance | Refer to standard electrical characteristics list | Agilent 4338 |
| Rated Current | | DC Power Supply Over Rated Current requirements, there will be some risk |
| Temperature Rise Test | Rated Current ΔT 20 ℃ Max | Applied the allowed DC current. Temperature measured by digital surface Thermometer. |
| High Temperature Exposure(Storage) | | Preconditioning:Run through reflow for 3 times.(IPC/JEDEC J-STD-020F Classification Reflow Profiles) Unpowered Temperature: 125±2°C Upper Temperature: maximum specified operating temperature (whichever is higher). Minimum test temperature shall be 85°C (For ferrite EMI suppressors/filters only) Duration: 1000hrs Min. Measured at room temperature after placing for 24±4 hrs |
| Temperature Cycling | Appearance: No damage. Inductance: within±10% of initial value Q: Shall not exceed the specification value. DCR: Within ±15% of initial value and shall not exceed the specification value | Preconditioning:Run through reflow for 3 times.(IPC/JEDEC J-STD-020F Classification Reflow Profiles Unpowered Lower Temperature of the Chamber: -40°C (For Inductors/Transformers) -55°C (For ferrite EMI suppressors/filters) Upper Temperature of the Chamber: maximum specified operating temperature (temperature and shall not exceed 125°C) Condition for 1 cycle Step1: -40±2°C 30min Min Step2: 125±2°C transition time 1min MAX Step3: 125±2°C 30min Min. Step4: Dwell Time (Soak Time) 15 minutes minimum, 30 minutes minimum if component weighs above 28g Transition Time: 1 minute maximum Number of cycles: 1000 Measured at room temperature at least 24 hours after test conclusion. |
| Humidity Bias | Appearance: No damage. Inductance: within±10% of initial value Q: Shall not exceed the specification value. DCR: Within ±15% of initial value and shall not exceed the specification value | Preconditioning:Run through reflow for 3 times.(IPC/JEDEC J-STD-020F Classification Reflow Profiles Unpowered(For Inductors/Transformers) Apply 10% of maximum rated power.(For ferrite EMI suppressors/filters) Humidity :85±3%RH. Temperature :85±2°C. Duration :1000 hrs Min. Measured at room temperature after placing for 24±4 hrs |

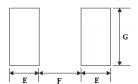
| <u>TAI-TECH</u> KBM01-241100884 P4 | | | | | |
|--------------------------------------|--|--|--|--|--|
| Item | Performance | Test Condition | | | |
| High Temperature Operational Life | Appearance: No damage. Inductance: within±10% of initial value Q: Shall not exceed the specification value. DCR: Within ±15% of initial value and shall not exceed the specification value | Preconditioning: Run through Reflow for 3 times. (IPC/JEDEC J-STD-020F Classification Reflow Profiles) Temperature: 125±2°C Upper Temperature of the Chamber: maximum specified operating temperature (not including heat rise) at maximum rated power and shall not exceed 125°C. (For Inductors/Transformers) Temperature of the Chamber: maximum specified operating temperature up to 150°C (For ferrite EMI suppressors/filters) Duration: 1000hrs Min. with 100% rated current. Measured at room temperature after placing for 24±4 hrs Rated I _L applied.(For ferrite EMI suppressors/filters) | | | |
| External Visual | Appearance : No damage. | Inspect device construction, marking and workmanship. Pre and Post Electrical Test not required. | | | |
| Physical Dimension | According to the product specification size measurement | Verify physical dimensions to the applicable component detail specification. Pre and Post Electrical Test not required. | | | |
| Mechanical Shock | Appearance: No damage. Inductance: within±10% of initial value Q: Shall not exceed the specification value. | Preconditioning:Run through reflow for 3 times. (IPC/JEDEC J-STD-020F Classification Reflow Profiles Test condition: Type alue duration (g's) (D) (ms) Wave form change (V) fit/sec SMD 100 6 Half-sine 12.3 THT 100 6 Half-sine 12.3 3 shocks in each direction along 3 perpendicular axes (18shocks). | | | |
| Vibration | DCR : Within ±15% of initial value and shall not exceed the specification value | Preconditioning:Run through reflow for 3 times.(IPC/JEDEC J-STD-020F Classification Reflow Profiles Oscillation Frequency: 10Hz ~ 2KHz ~ 10Hz for 20 minute Equipment: Vibration checker Total Amplitude:5g Testing Time: 12 hours(20 minutes, 12 cycles each of 3 orientations) ° | | | |
| | | Test condition: THT: Conditions B or C Number of heat cycles: 1 Solder Test technique Test tech | | | |
| | | Simulation Condition CO (s) and entersion rate | | | |
| | | temp) | | | |
| | Appearance: No damage. Inductance: within±10% of initial value Q: Shall not exceed the specification value. DCR: Within ±15% of initial value and shall not exceed the specification value | Depth: completely cover the termination SMD: Condition K, time above 217°C, 60s − 150s · Number of heat cycles:3 | | | |
| Resistance to Soldering Heat | | Temperature time 25°C to peak temperature component T _{Sron} T | | | |
| | | Continental Companies Com | | | |

| TAI-TECH | KBM01-241100884 | | | | |
|--------------------------------|---|--|--|--|--|
| Item | Performance | Test Condition | | | |
| ESD | Appearance: No damage. Inductance: within±10% of initial value Q: Shall not exceed the specification value. DCR: Within ±15% of initial value and shall not exceed the specification value | Direct Contact and Air Discharge PASSIVE COMPONENT HBM ESD Discharge Waveform to a Coaxial Target Test method: AEC-Q200-002 Test mode: Contact Discharge Discharge level: 4 KV (Level: 2) | | | |
| | | Through-hole Technology (THT) Method A1, Coating Durability Category 2 SMD: Method B1, Coating Durability Category 2 Method D, Coating Durability Category 2 Magnification 50x Pre and Post Electrical Test not required. Non-soldered type mounting/attach are not applicable. | | | |
| | | 参照 Method Al Method Bl Method D | | | |
| Solder ability | More than 95% of the terminal electrode should be covered with solder. | 焊接工藝 再流焊 其他器件的再流 無鉛銲接 | | | |
| | | 焊接類型 錫銀銅焊料 錫銀銅焊料 錫銀銅焊料 | | | |
| | | 浸入助焊劑 5-10s 5-10s 5-10s | | | |
| | | 浸入錫爐角 20°~45° 20°~45° 20°~45 | | | |
| | | 焊料溫度 245 ±5°C 245 ±5°C 260 ±5°C | | | |
| | | 浸入焊料時 5+0/-0.5s 5+0/-0.5s 30+5/-0s | | | |
| Electrical Characterization | Refer Specification for Approval | Parametrically test per lot and sample size requirements, (inductance only unless otherwise agreed upon) Summary to show minimum, maximum, mean and standard deviation at room, minimum and maximum | | | |
| | | operating temperatures. Pre and Post Electrical Test not required | | | |
| Board Flex (SMD) | Appearance: No damage. Inductance: within±10% of initial value Q: Shall not exceed the specification value. DCR: Within±15% of initial value and shall not exceed the specification value Support Solder Chip Printed circuit board before testing | Preconditioning: Run through Reflow for 3 times. (IPC/JEDEC J-STD-020F Classification Reflow Profiles) Place the 100mm X 40mm board into a fixture simila to the one shown in below Figure with the componen facing down. The apparatus shall consist of mechanical means to apply a force which will bend the board (D) x = 2 mm minimum. The duration of the applied forces shall be 60 (+ 5) sec. The force is to b applied only once to the board. | | | |
| | Printed circuit board under test Displacement | | | | |
| Terminal strength (SMD) | Appearance: No damage. Inductance: within±10% of initial value Q: Shall not exceed the specification value. DCR: Within±15% of initial value and shall not exceed the specification value | Preconditioning: Run through Reflow for 3 times. (IPC/JEDEC J-STD-020F Classification Reflow Profiles) With the component mounted on a PCB with the device to be tested, apply a 17.7 N (1.8 Kg) force to the side of a device being tested. This force shall be applied for 60 +1 seconds. Also the force shall be applied gradually as not to apply a shock to the component being tested. | | | |

6. Soldering and Mounting

6-1. Recommended PC Board Pattern

| | Chip Size | | | | | | Pattern w Sold | |
|-------|-----------|----------|-----------|----------|----------|-------|-------------------|-------|
| Serie | Туре | A(mm) | B(mm) | C(mm) | D(mm) | E(mm) | F(mm) | G(mm) |
| CPI | 201210 | 2.0±0.20 | 1.25±0.20 | 1.0 max. | 0.5±0.30 | 1.05 | 1.00 | 1.45 |



PC board should be designed so that products can prevent damage from mechanical stress when warping the board.

6-2. Soldering

Mildly activated rosin fluxes are preferred. TAI-TECH terminations are suitable for re-flow soldering systems. If hand soldering cannot be avoided, the preferred technique is the utilization of hot air soldering tools.

6-2.1 Soldering Reflow:

Recommended temperature profiles for lead free re-flow soldering in Figure 1. Table 1.1&1.2 (J-STD-020F)

6-2.2 Soldering Iron:

Products attachment with a soldering iron is discouraged due to the inherent process control limitations. In the event that a soldering iron must be employed the following precautions are recommended. (Figure 2.)

- Never contact the ceramic with the iron tip
- Use a 20 watt soldering iron with tip diameter of 1.0mm
- 350 $^{\circ}$ C tip temperature (max) 1.0mm tip diameter (max)
- Limit soldering time to 4~5sec.

Fig.1 Soldering Reflow

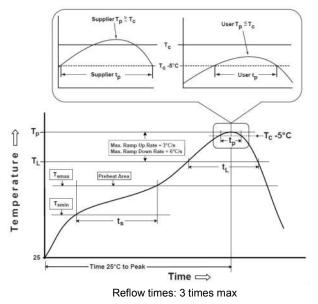
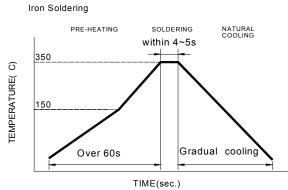


Fig.2 Iron soldering temperature profiles



Iron Soldering times: 1 times max

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Table (1.1): Reflow Profiles

| Profile Type: | Pb-Free Assembly |
|---|-------------------------------|
| Preheat -Temperature Min(T _{smin}) -Temperature Max(T _{smax}) -Time(t _s)from(T _{smin} to T _{smax}) | 150℃ 200℃ 60-120seconds |
| Ramp-up rate(T _L to T _p) | 3°C/second max. |
| $\label{eq:Liquidus} \begin{array}{l} \text{Liquidus temperature}(T_L) \\ \text{Time}(t_L) \\ \text{maintained above } T_L \\ \end{array}$ | 217℃ 60-150 seconds |
| Classification temperature(T _c) | See Table (1.2) |
| $\label{eq:total_power} \mbox{Time}(t_p) \mbox{ at Tc- } 5^{\circ} \!$ | < 30 seconds |
| Ramp-down rate(Tp to TL) | 6°C /second max. |
| Time 25℃ to peak temperature | 8 minutes max. |

Tp: maximum peak package body temperature, Tc: the classification temperature.

For user (customer) **Tp** should be equal to or less than **Tc**.

Table (1.2) Package Thickness/Volume and Classification Temperature (T_c)

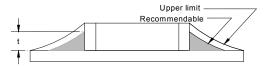
| | Package | Volume mm ³ | Volume mm ³ | Volume mm ³ |
|------------------|-----------|------------------------|------------------------|------------------------|
| | Thickness | <350 | 350-2000 | >2000 |
| | <1.6mm | 260°C | 260°C | 260°C |
| PB-Free Assembly | 1.6-2.5mm | 260°C | 250°C | 245°C |
| | ≥2.5mm | 250°C | 245°C | 245°C |

Reflow is referred to standard IPC/JEDEC J-STD-020F •

6-2.3 Solder Volume:

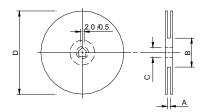
Accordingly increasing the solder volume, the mechanical stress to product is also increased. Exceeding solder volume may cause the failure of mechanical or electrical performance. Solder shall be used not to be exceed as shown in right side:

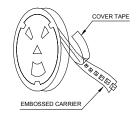
Minimum fillet height = soldering thickness + 25% product height



7. Packaging Information

7-1. Reel Dimension

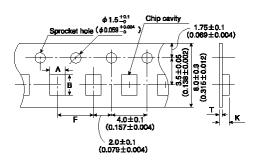




| Туре | A(mm) | B(mm) | C(mm) | D(mm) |
|--------|---------|-------|----------|-------|
| 7"x8mm | 9.0±0.5 | 60±2 | 13.5±0.5 | 178±2 |

7-2. Tape Dimension / 8mm

■Material of taping is plastic

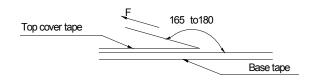


| Size | A(mm) | B(mm) | K(mm) | F(mm) | T(mm) |
|--------|-----------|-----------|---------|----------|-----------|
| 201210 | 1.40±0.10 | 2.25±0.10 | 1.30max | 4.0±0.10 | 0.22±0.05 |

7-3. Packaging Quantity

| Chip size | 201210 |
|------------|--------|
| Reel | 3000 |
| Inner box | 15000 |
| Middle box | 75000 |
| Carton | 150000 |

7-4. Tearing Off Force



The force for tearing off cover tape is 15 to 60 grams in the arrow direction under the following conditions.

| Room Temp. | Room Humidity | Room atm | Tearing Speed |
|------------|---------------|----------|---------------|
| (℃) | (%) | (hPa) | mm/min |
| 5~35 | 45~85 | 860~1060 | 300 |

Application Notice

· Storage Conditions(component level)

To maintain the solder ability of terminal electrodes:

- 1. TAI-TECH products meet IPC/JEDEC J-STD-020F standard-MSL, level 1.
- 2. Temperature and humidity conditions: Less than 40 $^{\circ}\mathrm{C}^{}$ and 60% RH.
- 3. Recommended products should be used within 12 months from the time of delivery.
- 4. The packaging material should be kept where no chlorine or sulfur exists in the air.
- Transportation
 - 1. Products should be handled with care to avoid damage or contamination from perspiration and skin oils.
 - 2. The use of tweezers or vacuum pick up is strongly recommended for individual components.
 - 3. Bulk handling should ensure that abrasion and mechanical shock are minimized.

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Test Report

號碼(No.): ETR23B04850

日期(Date): 05-Dec-2023

頁數(Page): 1 of 16

西北臺慶科技股份有限公司 (TAI-TECH ADVANCED ELECTRONICS CO., LTD.)

臺慶精密電子(昆山)有限公司 (TAI-TECH ADVANCED ELECTRONICS (KUN-SHAN) CO., LTD.)

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江蘇省昆山市篷朗昆嘉高科技工業區郭澤路 (GUO-ZE ROAD, KUNJIA HI-TECH INDUSTRIAL PARK, KUN-SHAN, JIANG-SU, CHINA)

中國·江蘇省·宿遷市·泗洪縣·經濟開發區杭州路南側·建設北路東側 (THE SOUTH HANGZHOU ROAD AND THE EAST JIANSHE ROAD · ECONOMIC DEVELOPMENT ZONE · SIHONG COUNTY · SUQIANCITY · JIANGSU PROVINCE · P,R · CHINA)

以下測試樣品係由申請廠商所提供及確認 (The following sample(s) was/were submitted and identified by the applicant as):

樣品名稱(Sample Name)

: FERRITE CHIP BEAD - FERRITE CHIP INDUCTOR - ARRAY - MCF - MCM -

YMV APM SERIES

樣品型號(Style/Item No.)

FERRITE CHIP BEAD . FERRITE CHIP INDUCTOR . ARRAY . MCF . MCM .

YMV . APM SERIES

收件日(Sample Receiving Date)

28-Nov-2023

測試期間(Testing Period)

28-Nov-2023 to 05-Dec-2023

測試需求(Test Requested)

依據客戶要求進行測試‧測試項目請參閱測試結果表格。 (Testing item(s) is/are

specified by client. Please refer to result table for testing item(s).)

測試結果(Test Results)

請參閱下一頁 (Please refer to following pages.)

Troy Chang / Department Ma ager Signed for and on behalf of SGS TAIWAN LTD.
Chemical Laboratory - Taipei

CHECK REPORT

PIN CODE: E94C4B9

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SGS Taiwan Ltd. 台灣檢驗科技股份有限公司



Test Report

號碼(No.): ETR23B04850

日期(Date): 05-Dec-2023

頁數(Page): 2 of 16

西北臺慶科技股份有限公司 (TAI-TECH ADVANCED ELECTRONICS CO., LTD.)

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江蘇省昆山市篷朗昆嘉高科技工業區郭澤路 (GUO-ZE ROAD, KUNJIA HI-TECH INDUSTRIAL PARK, KUN-SHAN, JIANG-SU, CHINA)

中國·江蘇省·宿遷市·泗洪縣·經濟開發區杭州路南側·建設北路東側 (THE SOUTH HANGZHOU ROAD AND THE EAST JIANSHE ROAD · ECONOMIC DEVELOPMENT ZONE · SIHONG COUNTY · SUQIANCITY · JIANGSU PROVINCE · P.R · CHINA)

測試部位敘述 (Test Part Description)

No.1 : 整體混測 (MIXED ALL PARTS)

測試結果 (Test Results)

| 測試項目 | 測試方法 | 單位 | MDL | 結果 |
|---------------------------------|---|--------|----------------|----------|
| (Test Items) | (Method) | (Unit) | | (Result) |
| | | | | No.1 |
| 鎘 (Cd) (Cadmium (Cd)) | 參考IEC 62321-5: 2013 · 以感應耦合電漿發 | mg/kg | 2 | n.d. |
| | 」射光譜儀分析。(With reference to IEC | | | |
| 鉛 (Pb) (Lead (Pb)) | 62321-5: 2013, analysis was performed by | mg/kg | 2 | n.d. |
| | ICP-OES.) | | | = |
| 汞 (Hg) (Mercury (Hg)) | 參考IEC 62321-4: 2013+ AMD1: 2017,以 | mg/kg | 2 | n.d. |
| | 感應耦合電漿發射光譜儀分析。(With | | | , |
| | reference to IEC 62321-4: 2013+ AMD1: | | | |
| | 2017, analysis was performed by ICP-OES.) | | | |
| 六價鉻 Cr(VI) (Hexavalent Chromium | 參考IEC 62321-7-2: 2017 · 以紫外光-可見光 | mg/kg | 8 | n.d. |
| Cr(VI)) | 分光光度計分析。(With reference to IEC | | | |
| | 62321-7-2: 2017, analysis was performed | | | |
| | by UV-VIS.) | | | |
| 一溴聯苯 (Monobromobiphenyl) | | mg/kg | 5 | n.d. |
| 二溴聯苯 (Dibromobiphenyl) |] | mg/kg | 5 | n.d. |
| 三溴聯苯 (Tribromobiphenyl) | | mg/kg | 5 | n.d. |
| 四溴聯苯 (Tetrabromobiphenyl) | 1 | mg/kg | 5 | n.d. |
| 五溴聯苯 (Pentabromobiphenyl) | 参考IEC 62321-6: 2015·以氣相層析儀/質譜 | mg/kg | 5 | n.d. |
| 六溴聯苯 (Hexabromobiphenyl) | 儀分析。(With reference to IEC 62321-6: | mg/kg | 5 | n.d. |
| 七溴聯苯 (Heptabromobiphenyl) | 2015, analysis was performed by GC/MS.) | mg/kg | 5 | n.d. |
| 八溴聯苯 (Octabromobiphenyl) | | mg/kg | 5 | n.d. |
| 九溴聯苯 (Nonabromobiphenyl) |] | mg/kg | 5 | n.d. |
| 十溴聯苯 (Decabromobiphenyl) |] | mg/kg | 5 | n.d. |
| 多溴聯苯總和 (Sum of PBBs) | | mg/kg | i s | n.d. |

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SGS Taiwan Ltd. 台灣檢驗科技股份有限公司



Test Report

號碼(No.): ETR23B04850

日期(Date): 05-Dec-2023

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西北臺慶科技股份有限公司 (TAI-TECH ADVANCED ELECTRONICS CO., LTD.)

臺慶精密電子(昆山)有限公司 (TAI-TECH ADVANCED ELECTRONICS (KUN-SHAN) CO., LTD.)

慶邦電子元器件 (泗洪) 有限公司 (TAIPAQ ELECTRONICS (SI-HONG) CO., LTD.)

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江蘇省昆山市篷朗昆嘉高科技工業區郭澤路 (GUO-ZE ROAD, KUNJIA HI-TECH INDUSTRIAL PARK, KUN-SHAN, JIANG-SU, CHINA)

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| 測試項目 | 測試方法 | 單位 | MDL | 結果 |
|---------------------------------------|--|-------------|-----|----------|
| (Test Items) | (Method) | (Unit) | | (Result) |
| | | | | No.1 |
| 一溴聯苯醚 (Monobromodiphenyl ether) | | mg/kg | 5 | n.d. |
| 二溴聯苯醚 (Dibromodiphenyl ether) | | mg/kg | 5 | n.d. |
| 三溴聯苯醚 (Tribromodiphenyl ether) | | mg/kg | 5 | n.d. |
| 四溴聯苯醚 (Tetrabromodiphenyl ether) | | mg/kg | 5 | n.d. |
| 五溴聯苯醚 (Pentabromodiphenyl ether) | 参考IEC 62321-6: 2015 · 以氣相層析儀/質譜 | mg/kg | 5 | n.d. |
| 六溴聯苯醚 (Hexabromodiphenyl ether) | 儀分析。(With reference to IEC 62321-6: | mg/kg | 5 | n.d. |
| 七溴聯苯醚 (Heptabromodiphenyl ether) | 2015, analysis was performed by GC/MS.) | mg/kg | 5 | n.d. |
| 八溴聯苯醚 (Octabromodiphenyl ether) | | mg/kg | 5 | n.d. |
| 九溴聯苯醚 (Nonabromodiphenyl ether) | | mg/kg | 5 | n.d. |
| 十溴聯苯醚 (Decabromodiphenyl ether) | | mg/kg | 5 | n.d. |
| 多溴聯苯醚總和 (Sum of PBDEs) | | mg/kg | 141 | n.d. |
| 鄰苯二甲酸丁苯甲酯 (BBP) (Butyl benzyl | | mg/kg | 50 | n.d. |
| phthalate (BBP)) | | | | |
| 鄰苯二甲酸二丁酯 (DBP) (Dibutyl | | mg/kg | 50 | n.d. |
| phthalate (DBP)) | | E-931 (3)53 | | |
| 鄰苯二甲酸二(2-乙基己基)酯 (DEHP) (Di- | | mg/kg | 50 | n.d. |
| (2-ethylhexyl) phthalate (DEHP)) | <u> </u> | | | |
| 鄰苯二甲酸二異丁酯 (DIBP) (Diisobutyl | 參考IEC 62321-8: 2017 · 以氣相層析儀/質譜 儀分析。(With reference to IEC 62321-8: | mg/kg | 50 | n.d. |
| phthalate (DIBP)) | 2017, analysis was performed by GC/MS.) | | | |
| 鄰苯二甲酸二異癸酯 (DIDP) (Diisodecyl | 2017, analysis was performed by GC/WS.) | mg/kg | 50 | n.d. |
| phthalate (DIDP)) (CAS No.: 26761-40- | | DBS 290 | | |
| 0, 68515-49-1) | | | | |
| 鄰苯二甲酸二異壬酯 (DINP) (Diisononyl | | mg/kg | 50 | n.d. |
| phthalate (DINP)) (CAS No.: 28553-12- | | \$ (\$ | | |
| 0, 68515-48-0) | | | | |

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| 測試項目 (Test Items) | 測試方法 (Method) | 單位 (Unit) | MDL | 結果 (Result) |
|--|--|--------------|------|----------------|
| ## - 日歌 - 丁 女能 (DNOD) (D: | | | | No.1 |
| 娜苯二甲酸二正辛酯 (DNOP) (Di-n-octyl phthalate (DNOP)) (CAS No.: 117-84-0) | | mg/kg | 50 | n.d. |
| 娜苯二甲酸二正戊酯 (DNPP) (Di-n-pentyl phthalate (DNPP)) (CAS No.: | 參考IEC 62321-8: 2017·以氣相層析儀/質譜 儀分析。(With reference to IEC 62321-8: | mg/kg | 50 | n.d. |
| 131-18-0) | 2017, analysis was performed by GC/MS.) | | | |
| 郷苯二甲酸二正己酯 (DNHP) (Di-n-hexyl | | mg/kg | 50 | n.d. |
| phthalate (DNHP)) (CAS No.: 84-75-3) 六溴環十二烷及所有主要被辨別出的異構 | 參考IEC 62321-9: 2021 · 以氣相層析儀/質譜 | mg/kg | 20 | n.d. |
| 物(HBCDD) (α- HBCDD, β- HBCDD, γ- | 儀分析。(With reference to IEC 62321-9: | mg/kg | 20 | 111.01 |
| HBCDD) (Hexabromocyclododecane (HBCDD) and all major | 2021, analysis was performed by GC/MS.) | | | |
| diastereoisomers identified (α- HBCDD, | | | | |
| β- HBCDD, γ- HBCDD)) (CAS No.: | | | | |
| 25637-99-4, 3194-55-6 (134237-51-7, 134237-50-6, 134237-52-8)) | | | | |
| 氟 (F) (Fluorine (F)) (CAS No.: 14762-94- | | mg/kg | 50 | n.d. |
| 8) | | | | |
| 氯 (Cl) (Chlorine (Cl)) (CAS No.: 22537- 15-1) | 參考BS EN 14582: 2016 · 以離子層析儀分析。(With reference to BS EN 14582: 2016, | mg/kg | 50 | n.d. |
| 溴 (Br) (Bromine (Br)) (CAS No.: 10097- | analysis was performed by IC.) | mg/kg | 50 | n.d. |
| 32-2) | | | | |
| 碘 (I) (Iodine (I)) (CAS No.: 14362-44-8) | | mg/kg | 50 | n.d. |
| 全氟辛烷磺酸及其鹽類 (PFOS and its salts) (CAS No.: 1763-23-1 and its salts) | 参考CEN/TS 15968: 2010 · 以液相層析串聯 質譜儀分析。(With reference to CEN/TS | mg/kg | 0.01 | n.d. |
| 全氟辛酸及其鹽類 (PFOA and its salts) (CAS No.: 335-67-1 and its salts) | 15968: 2010, analysis was performed by LC/MS/MS.) | mg/kg | 0.01 | n.d. |

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| 測試項目 | 測試方法 | 單位 | MDL | 結果 |
|---|---------------------------------------|----------|-----|----------|
| (Test Items) | (Method) | (Unit) | | (Result) |
| | | | | No.1 |
| 銻 (Sb) (Antimony (Sb)) (CAS No.: 7440- | | mg/kg | 2 | n.d. |
| 36-0) | 參考US EPA 3052: 1996 · 以感應耦合電漿發 | | | |
| 鈹 (Be) (Beryllium (Be)) (CAS No.: 7440- | 射光譜儀分析。(With reference to US EPA | mg/kg | 2 | n.d. |
| 41-7) | 3052: 1996, analysis was performed by | 48 48 | | |
| 砷 (As) (Arsenic (As)) (CAS No.: 7440- | ICP-OES.) | mg/kg | 2 | n.d. |
| 38-2) | | -22 -392 | | |
| 聚氯乙烯 (Polyvinyl chloride) (PVC) | 參考ASTM E1252: 2021 · 以傅立葉轉換紅外 | ** | 128 | Negative |
| | 線光譜儀及焰色法分析。(With reference to | | | |
| | ASTM E1252: 2021, analysis was | | | |
| | performed by FT-IR and Flame Test.) | | | |

備註(Note):

- 1. mg/kg = ppm; 0.1wt% = 0.1% = 1000ppm
- 2. MDL = Method Detection Limit (方法偵測極限值)
- 3. n.d. = Not Detected (未檢出); 小於MDL / Less than MDL
- 4. "-" = Not Regulated (無規格值)
- 5. ** = Qualitative analysis (No Unit) 定性分析(無單位)
- 6. Negative = Undetectable 陰性(未偵測到); Positive = Detectable 陽性(已偵測到)
- 7. 樣品的測試是基於申請人要求混合測試,報告中的混合測試結果不代表其中個別單一材質的含量。
 The sample(s) was/were analyzed on behalf of the applicant as mixing sample in one testing. The above result(s) was/were only given as the informality value.

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PFAS Remark:

現有PFAS定量技術是分析PFAS物質的特定結構,但同碳數族群之PFAS酸及鹽類物質,其可被辨識的特定結構相同,因此無法區別所分析的特定結構是來自酸或者鹽類,故測試結果為同碳數族群之PFAS之酸及鹽類物質的濃度總合。下表PFAS物質濃度皆已包含在測試結果中,相關資訊請參見下表:(下表列舉PFAS物質僅為範例,並不包含所有同碳數族群之PFAS鹽類。)

(The quantitative technology of PFAS is to analyze the specific structure of PFAS substances. However, PFAS acid and its salts with the same carbon number group have the same specific structure that can be identified. The tested results of the analyzed specific structure cannot be distinguished to identify the contribution from PFAS acid or its salts. Therefore, the tested results display the sum of concentrations of PFAS acids and its salts with the same carbon number group. The concentration of PFAS substances in the below table have been included in the tested results, please refer to the table for relevant information: (The listed PFAS substances are examples only, it do not include all PFAS salts with the same carbon number group.))

| 物質濃度分類 (Classification of Substance Concentration) | 物質名稱 (Substance Name) | CAS No. |
|--|--|-------------|
| 全氟辛烷磺酸及其鹽類 Perfluorooctane sulfonates and its | 全氟辛基磺酸鉀 (PFOS-K) Potassium perfluorooctanesulfonate (PFOS-K) | 2795-39-3 |
| salts (PFOS and its salts) (CAS No.: 1763-23-1 and its salts) | 全氟辛基磺酸鋰 (PFOS-Li) Perfluorooctanesulfonic acid, lithium salt (PFOS-Li) | 29457-72-5 |
| | 全氟辛基磺酸銨 (PFOS-NH ₄) Perfluorooctanesulfonic acid, ammonium salt (PFOS-NH ₄) | 29081-56-9 |
| | 全氟辛基磺酸二乙醇銨 (PFOS-NH(OH) ₂) Perfluorooctane sulfonate diethanolamine salt (PFOS-NH(OH) ₂) | 70225-14-8 |
| | 全氟辛基磺酸四乙基銨 (PFOS-N(C_2H_5) ₄) Perfluorooctanesulfonic acid,tetraethylammonium salt (PFOS-N(C_2H_5) ₄) | 56773-42-3 |
| | 全氟辛基磺酸二癸二甲基銨 (PFOS-DDA) N-decyl-N,N-dimethyldecan-1-aminium 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluorooctane-1-sulfonate (PFOS-DDA) | 251099-16-8 |

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| 物質濃度分類 (Classification of Substance Concentration) | 物質名稱 (Substance Name) | CAS No. |
|--|---|------------|
| 全氟辛烷磺酸及其鹽類 Perfluorooctane sulfonates and its | 全氟辛基磺醯氟 (POSF) Perfluorooctane sulfonyl fluoride (POSF) | 307-35-7 |
| salts (PFOS and its salts) (CAS No.: 1763-23-1 and its salts) | 全氟辛基磺酸鎂 (PFOS-Mg) Perfluorooctanesulfonic acid, magnesium salt (PFOS-Mg) | 91036-71-4 |
| | 全氟辛基磺酸鈉 (PFOS-Na) Perfluorooctanesulfonic acid, sodium salt (PFOS-Na) | 4021-47-0 |
| 全氟辛酸及其鹽類 Perfluorooctanoic acid and its salts | 全氟辛酸鈉 (PFOA-Na) Sodium perfluorooctanoate (PFOA-Na) | 335-95-5 |
| (PFOA and its salts) (CAS No.: 335-67-1 and its salts) | 全氟辛酸鉀 (PFOA-K) Potassium perfluorooctanoate (PFOA-K) | 2395-00-8 |
| | 全氟辛酸銀 (PFOA-Ag) Silver perfluorooctanote (PFOA-Ag) | 335-93-3 |
| | 全氟辛氟 (PFOA-F) Perfluorooctanoyl fluoride (PFOA-F) | 335-66-0 |
| | 全氟辛酸銨 (APFO) Ammonium pentadecafluorooctanoate (APFO) | 3825-26-1 |
| | 全氟辛酸鋰 (PFOA-Li) Lithium perfluorooctanoate (PFOA-Li) | 17125-58-5 |

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SGS Taiwan Ltd. 台灣檢驗科技股份有限公司



Test Report

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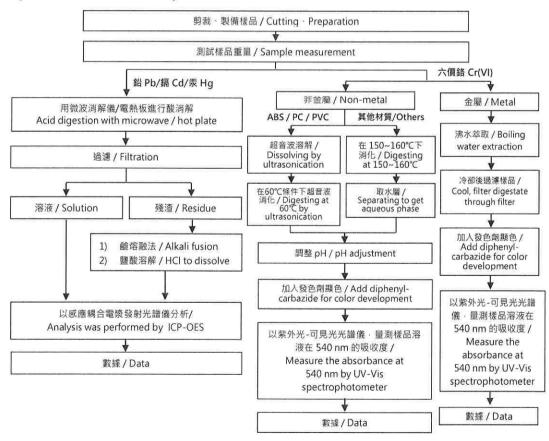
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重金屬流程圖 / Analytical flow chart of heavy metal

根據以下的流程圖之條件,樣品已完全溶解。(六價鉻測試方法除外)

These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr^{6+} test method excluded)



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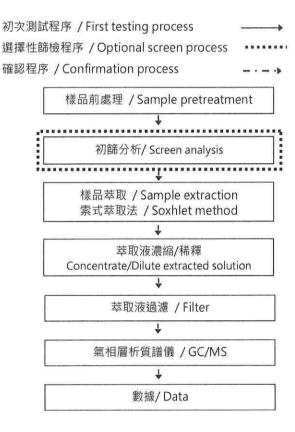
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多溴聯苯/多溴聯苯醚分析流程圖 / Analytical flow chart - PBBs/PBDEs



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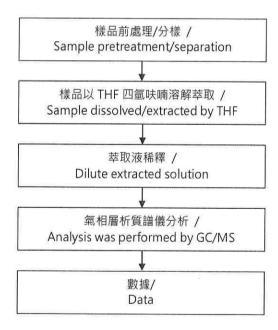
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可塑劑分析流程圖 / Analytical flow chart - Phthalate

【測試方法/Test method: IEC 62321-8】



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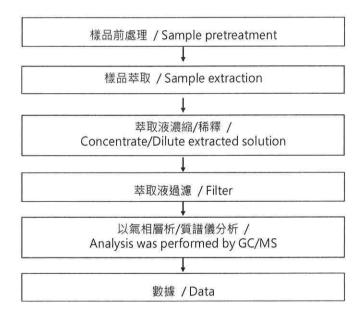
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六溴環十二烷分析流程圖 / Analytical flow chart - HBCDD



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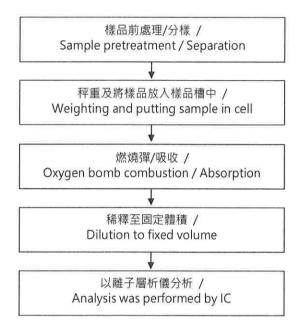
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鹵素分析流程圖 / Analytical flow chart - Halogen



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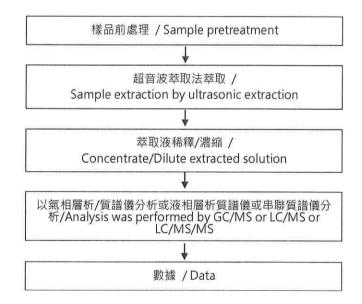
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全氟化合物(包含全氟辛酸/全氟辛烷磺酸/其相關化合物等等)分析流程圖 / Analytical flow chart – PFAS (including PFOA/PFOS/its related compound, etc.)



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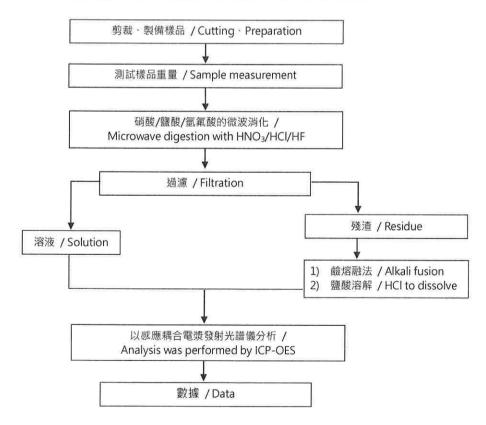
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元素(含重金屬)分析流程圖 / Analytical flow chart of elements (Heavy metal included)

根據以下的流程圖之條件,樣品已完全溶解。

These samples were dissolved totally by pre-conditioning method according to below flow chart.

【參考方法/Reference method: US EPA 3051A、US EPA 3052】



* US EPA 3051A 方法未添加氫氟酸 / US EPA 3051A method does not add HF.

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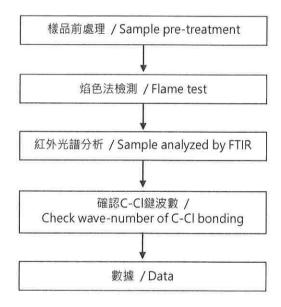
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聚氯乙烯物質判定分析流程圖 / Analysis flow chart - PVC



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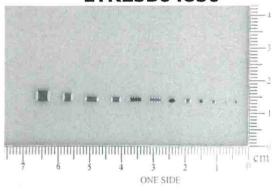
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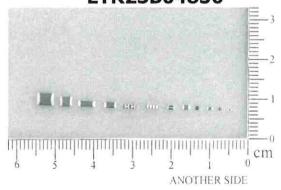
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* 照片中如有箭頭標示,則表示為實際檢測之樣品/部位. * (The tested sample / part is marked by an arrow if it's shown on the photo.)

ETR23B04850



ETR23B04850



** 報告結尾 (End of Report) **

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SGS Taiwan Ltd. 台灣檢驗科技股份有限公司

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