

Specification for Approval

Date: 2023/07/19

Customer : _____

TAI-TECH P/N: WCM4532F2SV-900T40-HI-HD

CUSTOMER P/N: _____

DESCRIPTION: _____

QUANTITY: _____ pcs

| | | |
|----------------------------|--|--|
| REMARK: | | |
| | | |
| Customer Approval Feedback | | |
| | | |

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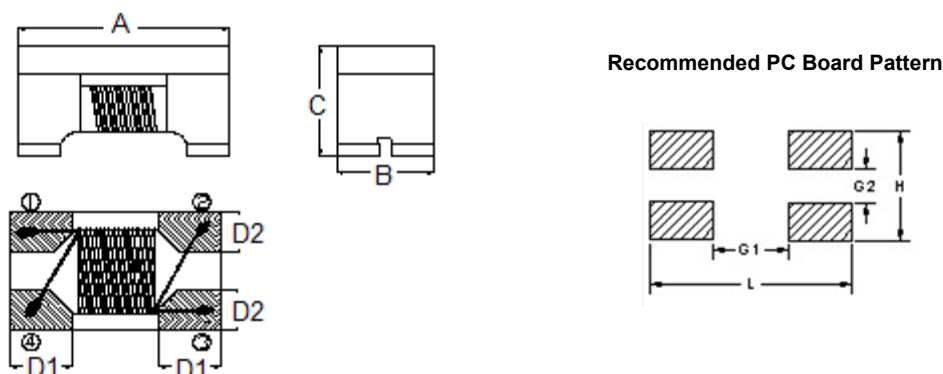
Wire Wound Type Common Mode Filter WCM4532F2SV-900T40-HI-HD

1. Features

1. High common mode impedance at high frequency cause excellent noise suppression performance.
2. WCM4532F2SV series realizes small size and low profile. 4.5x3.2x2.8 mm.
3. 100% Lead(Pb) & Halogen-Free and RoHS compliant.
4. High reliability -Reliability tests comply with AEC-Q200
5. Operating temperature -55~+125°C (Including self - temperature rise)



2. Dimension



| Series | A(mm) | B(mm) | C(mm) | D1(mm) | D2(mm) | L(mm) | H(mm) | G1(mm) | G2(mm) |
|----------|---------|---------|---------|-----------|-----------|-------|-------|--------|--------|
| 4532F2SV | 4.5±0.2 | 3.2±0.2 | 2.8±0.2 | 0.90±0.15 | 1.05±0.15 | 5.0 | 3.6 | 3.0 | 1.2 |

Units: mm

3. Part Numbering

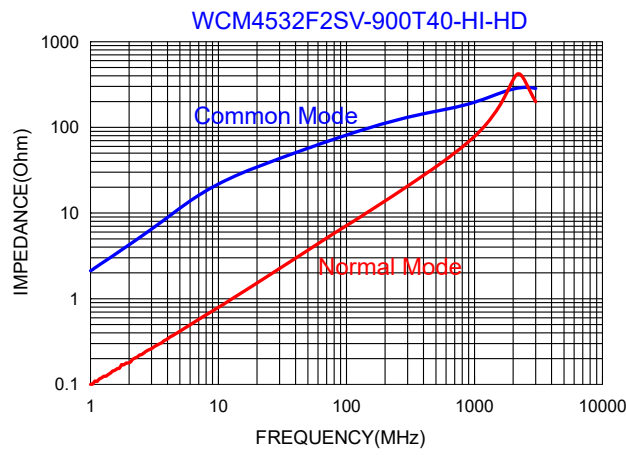


- A: Series
 B: Dimension
 C: Material Ferrite Core
 D: Number of Lines 2=2 lines
 E: Type S=Shielded , N=Unshielded
 F: Category Code V=Vehicle
 G: Impedance 900=90Ω
 H: Packaging T=Taping and Reel
 I: Rated Current 40=4000mA
 J: Control S/N
 K: Control S/N

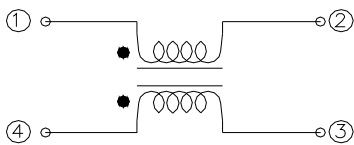
4. Specification

| TAI-TECH Part Number | Common mode Impedance (Ω) | | Test Frequency (MHz) | DC Resistance (Ω) max. | Rated Current (mA) max. | Rated Volt. (Vdc) max. | Withstand Volt. (Vdc) max. | IR (Ω) min. |
|--------------------------|---------------------------|---------|----------------------|------------------------|-------------------------|------------------------|----------------------------|-------------|
| | 68 min | 90 typ. | | | | | | |
| WCM4532F2SV-900T40-HI-HD | 68 min | 90 typ. | 100 | 0.050 | 4000 | 50 | 125 | 10M |

Note: When current is applied , the temperature of the part should not exceed 125°C

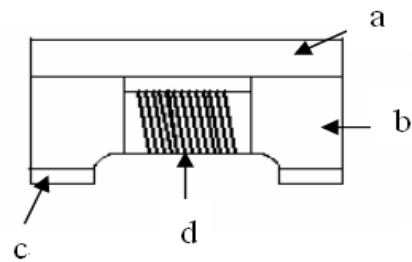


5. Schematic Diagram



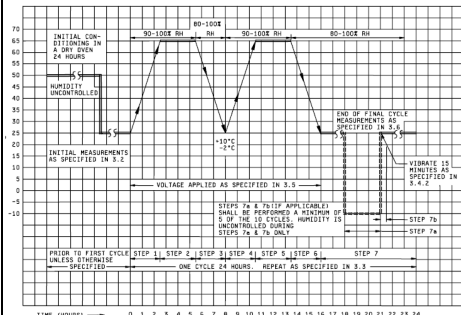
6. Materials

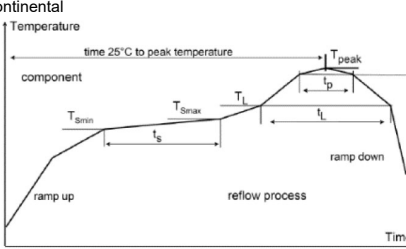
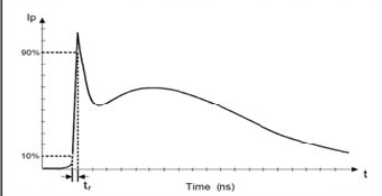
| No. | Description | Specification |
|-----|-------------|----------------------|
| a. | Upper Plate | Ferrite |
| b. | Core | Ferrite Core |
| c. | Termination | Ag/Ni/Sn |
| d. | Wire | Enameled Copper Wire |

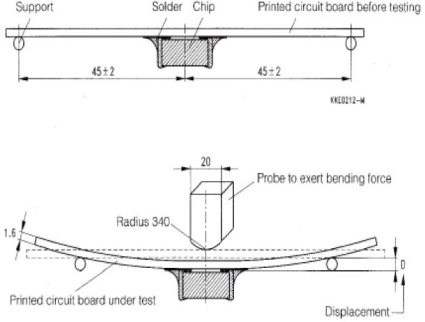
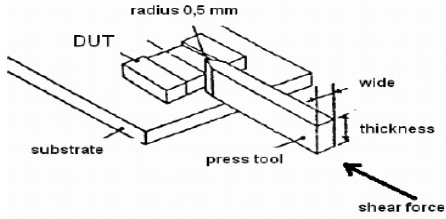


7. Reliability and Test Condition

| Item | Performance | Test Condition | | | | | | | | | | | | | | | |
|---|---|--|-----------|----------------------------|--------------------------|-----------|----------------------------|-----|-----|---|-----------|------|------|-----|---|-----------|------|
| Operating temperature | -55~+125°C (Including self - temperature rise) | | | | | | | | | | | | | | | | |
| Storage temperature | -55~+125°C (on board) | | | | | | | | | | | | | | | | |
| Electrical Performance Test | | | | | | | | | | | | | | | | | |
| Z(common mode) | Refer to standard electrical characteristics list. | Keysight E4991B + Keysight 16197A | | | | | | | | | | | | | | | |
| DCR | | Agilent-34420A Agilent-4338B | | | | | | | | | | | | | | | |
| I.R. | | Chroma 19073 | | | | | | | | | | | | | | | |
| Temperature Rise Test | | 1.Applied the allowed DC current. 2.Temperature measured by digital surface thermometer | | | | | | | | | | | | | | | |
| Reliability Test | | | | | | | | | | | | | | | | | |
| High Temperature Exposure(Storage) AEC-Q200 | Appearance : No damage. Impedance : within±15% of initial value RDC : within ±15% of initial value and shall not exceed the specification value | Preconditioning: Run through reflow for 3 times.(IPC/JEDEC J-STD-020E Classification Reflow Profiles) Temperature : 125±2°C Duration : 1000hrs Min. Measured at room temperature after placing for 24±4 hrs. | | | | | | | | | | | | | | | |
| Temperature Cycling AEC-Q200 | | Preconditioning: Run through reflow for 3 times.(IPC/JEDEC J-STD-020E Classification Reflow Profiles) Condition for 1 cycle Step1 : -55±2°C 30min Min. Step2 : 125±2°C transition time 1min MAX. Step3 : 125±2°C 30min Min. Step4 : Low temp. Transition time 1min MAX. Number of cycles : 1000 Measured at room temperature after placing for 24±4 hrs. | | | | | | | | | | | | | | | |
| Moisture Resistance (AEC-Q200) | | t=24 hours/cycle. Note: Steps 7a & 7b not required. Unpowered. Measurement at 24±2 hours after test conclusion. | | | | | | | | | | | | | | | |
| Biased Humidity (AEC-Q200) | | Preconditioning: Run through reflow for 3 times.(IPC/JEDEC J-STD-020E Classification Reflow Profiles) Humidity : 85±3%R.H. Temperature : 85°C±2°C Duration: 1000hrs Min. Measured at room temperature after placing for 24±4hrs. | | | | | | | | | | | | | | | |
| High Temperature Operational Life (AEC-Q200) | | Preconditioning: Run through reflow for 3 times.(IPC/JEDEC J-STD-020E Classification Reflow Profiles) Temperature : 125±2°C Duration : 1000hrs Min. with 100% rated current. Measured at room temperature after placing for 24±4hrs. | | | | | | | | | | | | | | | |
| External Visual | Appearance : No damage. | Inspect device construction, marking and workmanship. Electrical Test not required. | | | | | | | | | | | | | | | |
| Physical Dimension | According to the product specification size measurement | According to the product specification size measurement | | | | | | | | | | | | | | | |
| Resistance to Solvents | | Add aqueous wash chemical - OKEM clean or equivalent. | | | | | | | | | | | | | | | |
| Mechanical Shock | Appearance : No damage. Impedance : within±15% of initial value RDC : within ±15% of initial value and shall not exceed the specification value | <table border="1"> <thead> <tr> <th>Type</th> <th>Peak value (g's)</th> <th>Normal duration (D) (ms)</th> <th>Wave form</th> <th>Velocity change (Vi)ft/sec</th> </tr> </thead> <tbody> <tr> <td>SMD</td> <td>100</td> <td>6</td> <td>Half-sine</td> <td>12.3</td> </tr> <tr> <td>Lead</td> <td>100</td> <td>6</td> <td>Half-sine</td> <td>12.3</td> </tr> </tbody> </table> <p>3 shocks in each direction along 3 perpendicular axes. (18 shocks)</p> | Type | Peak value (g's) | Normal duration (D) (ms) | Wave form | Velocity change (Vi)ft/sec | SMD | 100 | 6 | Half-sine | 12.3 | Lead | 100 | 6 | Half-sine | 12.3 |
| Type | Peak value (g's) | Normal duration (D) (ms) | Wave form | Velocity change (Vi)ft/sec | | | | | | | | | | | | | |
| SMD | 100 | 6 | Half-sine | 12.3 | | | | | | | | | | | | | |
| Lead | 100 | 6 | Half-sine | 12.3 | | | | | | | | | | | | | |



| Item | Performance | Test Condition | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|--|-----------------------|------------------|--|-----------------------|----------------------|-------------------|---|---|----------------|------------------|------------------|----------------|------------------|----------------|----------------|----------------------|-------------------|-----------|---|---|--------|-------|--------|--------|------|--------|------|---|--------|-------|---|---|--------|-------|--------|--------|------|--------|-------|---|--------|-------|
| Vibration | | Preconditioning: Run through reflow for 3 times.(IPC/JEDEC J-STD-020E Classification Reflow Profiles) Oscillation Frequency : 10Hz~2kHz~ 10Hz for 20 minutes Equipment : Vibration checker Total Amplitude : 5g Testing Time : 12 hours (20 minutes, 12 cycles each of 3 orientations) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Resistance to Soldering Heat | Appearance : No damage. Impedance : within±15% of initial value RDC : within ±15% of initial value and shall not exceed the specification value | Test condition : <table border="1" data-bbox="943 412 1406 524"> <thead> <tr> <th>Temperature(°C)</th> <th>Time(s)</th> <th>Temperature ramp/immersion and emersion rate</th> <th>Number of heat cycles</th> </tr> </thead> <tbody> <tr> <td>260 ±5 (solder temp)</td> <td>10 ±1</td> <td>25mm/s ±6 mm/s</td> <td>1</td> </tr> </tbody> </table> Depth: completely cover the termination Continental  <table border="1" data-bbox="922 837 1417 1016"> <thead> <tr> <th>Component Size</th> <th>Ramp up to 150°C</th> <th>T_{min}</th> <th>t_s</th> <th>T_{max}</th> <th>T_L</th> <th>t_L</th> <th>T_{peak}**</th> <th>t₁**</th> <th>Ramp down</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Thickness < 1.5mm or Thickness 1.5mm-2.5mm and Volume < 350 mm³</td> <td rowspan="2">3.0±0.1°C/s (The component shall be specified for usage in serial production with up to 3.0°C/s)</td> <td rowspan="2">≥190°C</td> <td rowspan="2">≥110s</td> <td rowspan="2">≥200°C</td> <td rowspan="2">≥217°C</td> <td rowspan="2">≥90s</td> <td>≥260°C</td> <td>340s</td> <td rowspan="2">6.0±0.1°C/s (The component shall be specified for usage in serial production with up to 6.0°C/s)</td> </tr> <tr> <td>≥250°C</td> <td>≥300s</td> </tr> <tr> <td rowspan="2">Thickness > 2.5mm and Volume < 350 mm³ or Thickness 1.5mm-2.5mm and Volume > 2000 mm³ or Thickness > 2.5mm and Volume > 350 mm³</td> <td rowspan="2">3.0±0.1°C/s (The component shall be specified for usage in serial production with up to 3.0°C/s)</td> <td rowspan="2">≥190°C</td> <td rowspan="2">≥110s</td> <td rowspan="2">≥200°C</td> <td rowspan="2">≥217°C</td> <td rowspan="2">≥90s</td> <td>≥245°C</td> <td>≥300s</td> <td rowspan="2">6.0±0.1°C/s (The component shall be specified for usage in serial production with up to 6.0°C/s)</td> </tr> <tr> <td>≥250°C</td> <td>≥300s</td> </tr> </tbody> </table> Table 1: Minimum requirements for lead-free soldering *peak temperature is measured on the centre top of the component package ** t ₁ measured @ T _{peak} -5°C | Temperature(°C) | Time(s) | Temperature ramp/immersion and emersion rate | Number of heat cycles | 260 ±5 (solder temp) | 10 ±1 | 25mm/s ±6 mm/s | 1 | Component Size | Ramp up to 150°C | T _{min} | t _s | T _{max} | T _L | t _L | T _{peak} ** | t ₁ ** | Ramp down | Thickness < 1.5mm or Thickness 1.5mm-2.5mm and Volume < 350 mm ³ | 3.0±0.1°C/s (The component shall be specified for usage in serial production with up to 3.0°C/s) | ≥190°C | ≥110s | ≥200°C | ≥217°C | ≥90s | ≥260°C | 340s | 6.0±0.1°C/s (The component shall be specified for usage in serial production with up to 6.0°C/s) | ≥250°C | ≥300s | Thickness > 2.5mm and Volume < 350 mm ³ or Thickness 1.5mm-2.5mm and Volume > 2000 mm ³ or Thickness > 2.5mm and Volume > 350 mm ³ | 3.0±0.1°C/s (The component shall be specified for usage in serial production with up to 3.0°C/s) | ≥190°C | ≥110s | ≥200°C | ≥217°C | ≥90s | ≥245°C | ≥300s | 6.0±0.1°C/s (The component shall be specified for usage in serial production with up to 6.0°C/s) | ≥250°C | ≥300s |
| Temperature(°C) | Time(s) | Temperature ramp/immersion and emersion rate | Number of heat cycles | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 260 ±5 (solder temp) | 10 ±1 | 25mm/s ±6 mm/s | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Component Size | Ramp up to 150°C | T _{min} | t _s | T _{max} | T _L | t _L | T _{peak} ** | t ₁ ** | Ramp down | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Thickness < 1.5mm or Thickness 1.5mm-2.5mm and Volume < 350 mm ³ | 3.0±0.1°C/s (The component shall be specified for usage in serial production with up to 3.0°C/s) | ≥190°C | ≥110s | ≥200°C | ≥217°C | ≥90s | ≥260°C | 340s | 6.0±0.1°C/s (The component shall be specified for usage in serial production with up to 6.0°C/s) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | ≥250°C | ≥300s | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Thickness > 2.5mm and Volume < 350 mm ³ or Thickness 1.5mm-2.5mm and Volume > 2000 mm ³ or Thickness > 2.5mm and Volume > 350 mm ³ | 3.0±0.1°C/s (The component shall be specified for usage in serial production with up to 3.0°C/s) | ≥190°C | ≥110s | ≥200°C | ≥217°C | ≥90s | ≥245°C | ≥300s | 6.0±0.1°C/s (The component shall be specified for usage in serial production with up to 6.0°C/s) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | ≥250°C | ≥300s | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Thermal shock (AEC-Q200) | | Preconditioning: Run through reflow for 3 times.(IPC/JEDEC J-STD-020E Classification Reflow Profiles) Condition for 1 cycle Step1 : -55±2°C 15±1min Step2 : 125±2°C within 20Sec. Step3 : 125±2°C 15±1min Number of cycles : 300 Measured at room temperature after placing for 24±4hrs. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ESD | Appearance : No damage. Impedance : within±15% of initial value RDC : 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) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Solderability | More than 95% of the terminal electrode should be covered with solder | a. Method B, 4hrs @155°C dry heat @235°C±5°C Testing Time :5 +0/-0.5 seconds b. Method D category 3, (8hours ± 15 min)@ 260°C±5°C Testing Time :30 +0/-0.5 seconds | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Electrical Characterization | Refer Specification for Approval | Summary to show Min, Max, Mean and Standard deviation. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Flammability | Electrical Test not required. | V-0 or V-1 are acceptable. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Item | Performance | Test Condition |
|-------------------------------|---|--|
| <p>Board Flex</p> | <p>Appearance : No damage. Impedance : within $\pm 15\%$ of initial value RDC : within $\pm 15\%$ of initial value and shall not exceed the specification value</p> | <p>Preconditioning: Run through reflow for 3 times. (IPC/JEDEC J-STD-020E Classification Reflow Profiles) Place the 100mm X 40mm board into a fixture similar to the one shown in below Figure with the component 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 be applied only once to the board.</p>  |
| <p>Terminal Strength(SMD)</p> | <p>Appearance : No damage. Impedance : within $\pm 15\%$ of initial value RDC : within $\pm 15\%$ of initial value and shall not exceed the specification value</p> | <p>Preconditioning: Run through reflow for 3 times. (IPC/JEDEC J-STD-020E 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.</p>  |

8. Soldering and Mounting

8-1. 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.

8-1.1 Soldering Reflow:

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

8-1.2 Soldering Iron(Figure 2):

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.)

- Preheat circuit and products to 150°C
- Never contact the ceramic with the iron tip
- Use a 20 watt soldering iron with tip diameter of 1.0mm
- 350°C tip temperature (max)
- 1.0mm tip diameter (max)
- Limit soldering time to 4~5sec.

Fig.1 Soldering Reflow

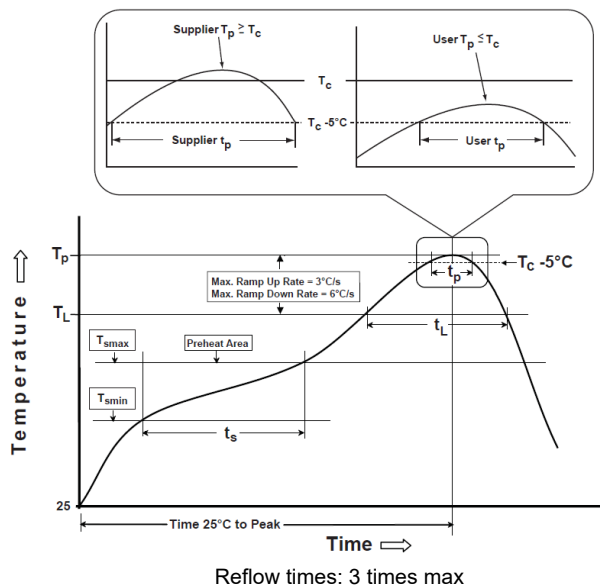


Fig.2 Iron soldering temperature profiles

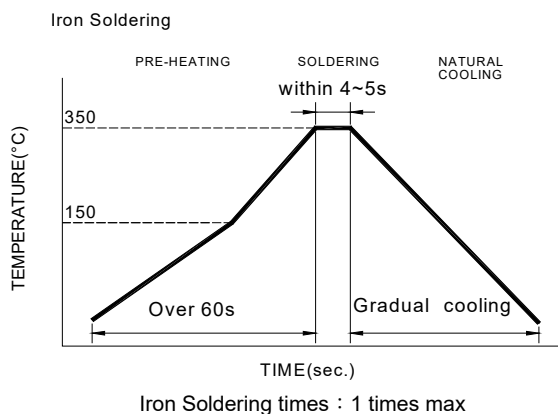


Table (1.1): Reflow Profiles

| | |
|---|---------------------------------|
| Profile Type: | Pb-Free Assembly |
| Preheat -Temperature Min(T_{smin}) -Temperature Max(T_{smax}) -Time(t_s)from(T_{smin} to T_{smax}) | 150°C 200°C 60-120seconds |
| Ramp-up rate(T_L to T_p) | 3°C/second max. |
| Liquidus temperature(T_L) Time(t_L)maintained above T_L | 217°C 60-150 seconds |
| Classification temperature(T_c) | See Table (1.2) |
| Time(t_p) at $T_c - 5^\circ\text{C}$ (T_p should be equal to or less than T_c .) | < 30 seconds |
| Ramp-down rate(T_p to T_L) | 6°C /second max. |
| Time 25°C to peak temperature | 8 minutes max. |

T_p: maximum peak package body temperature, **T_c**: the classification temperature.

For user (customer) **T_p** should be equal to or less than **T_c**.

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

| | Package Thickness | Volume mm ³ <350 | Volume mm ³ 350-2000 | Volume mm ³ >2000 |
|------------------|-------------------|--------------------------------|------------------------------------|---------------------------------|
| PB-Free Assembly | <1.6mm | 260°C | 260°C | 260°C |
| | 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-020E ◦



測試報告 Test Report

號碼(No.): ETR23302694

日期(Date): 17-Mar-2023

頁數(Page): 1 of 15

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.)
慶邦電子元件(泗洪)有限公司 (TAIPAQ ELECTRONICS (SI-HONG) CO., LTD.)
桃園市楊梅區幼獅工業區幼四路1號 (NO. 1, YOU 4TH ROAD, YOUTH INDUSTRIAL DISTRICT, YANG-MEI, TAO-YUAN CITY, TAIWAN R. O. C.)
江蘇省昆山市蓬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) : WIREWOUND SERIES
樣品型號(Style/Item No.) : WCM(YCW) · WCL · HSF · HDMI · DVI · BCM · PCM · TCM · LCM · LPF · TXF · ACM · DCM(YLW) · WIH · BPH · TNH · YCM · STF · APO · QLL · FGO · APOC · TLAN SERIES

=====
收件日(Sample Receiving Date) : 10-Mar-2023
測試期間(Testing Period) : 10-Mar-2023 to 17-Mar-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 Manager
Signed for and on behalf of
SGS TAIWAN LTD.
Chemical Laboratory - Taipei



PIN CODE: 6621A826

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測試報告

Test Report

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日期(Date): 17-Mar-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.)

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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 (Test Items) | 測試方法 (Method) | 單位 (Unit) | MDL | 結果 (Result) |
|---|--|--------------|-----|----------------|
| | | | | No.1 |
| 鎘 (Cd) (Cadmium (Cd)) | 參考IEC 62321-5: 2013 · 以感應耦合電漿發射光譜儀分析。(With reference to IEC 62321-5: 2013, analysis was performed by ICP-OES.) | mg/kg | 2 | n.d. |
| 鉛 (Pb) (Lead (Pb)) | 參考IEC 62321-5: 2013 · 以感應耦合電漿發射光譜儀分析。(With reference to IEC 62321-5: 2013, analysis was performed by ICP-OES.) | mg/kg | 2 | n.d. |
| 汞 (Hg) (Mercury (Hg)) | 參考IEC 62321-4: 2013+ AMD1: 2017 · 以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.) | mg/kg | 2 | n.d. |
| 六價鉻 Cr(VI) (Hexavalent Chromium Cr(VI)) | 參考IEC 62321-7-2: 2017 · 以紫外光-可見光分光光度計分析。(With reference to IEC 62321-7-2: 2017, analysis was performed by UV-VIS.) | mg/kg | 8 | n.d. |

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| 測試項目 (Test Items) | 測試方法 (Method) | 單位 (Unit) | MDL | 結果 (Result) |
|----------------------------------|--|--------------|-----|----------------|
| | | | | No.1 |
| 一溴聯苯 (Monobromobiphenyl) | 參考IEC 62321-6: 2015 · 以氣相層析儀/質譜儀分析。(With reference to IEC 62321-6: 2015, analysis was performed by GC/MS.) | 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) | | mg/kg | 5 | n.d. |
| 五溴聯苯 (Pentabromobiphenyl) | | mg/kg | 5 | n.d. |
| 六溴聯苯 (Hexabromobiphenyl) | | mg/kg | 5 | n.d. |
| 七溴聯苯 (Heptabromobiphenyl) | | 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 | - | n.d. |
| 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) | | mg/kg | 5 | n.d. |
| 六溴聯苯醚 (Hexabromodiphenyl ether) | | mg/kg | 5 | n.d. |
| 七溴聯苯醚 (Heptabromodiphenyl ether) | | 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 | - | n.d. |

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測試報告

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| 測試項目 (Test Items) | 測試方法 (Method) | 單位 (Unit) | MDL | 結果 (Result) |
|--|---|--------------|-----|----------------|
| | | | | No.1 |
| 鄰苯二甲酸丁苯甲酯 (BBP) (Butyl benzyl phthalate (BBP)) | 參考IEC 62321-8: 2017, 以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.) | mg/kg | 50 | n.d. |
| 鄰苯二甲酸二丁酯 (DBP) (Dibutyl phthalate (DBP)) | | mg/kg | 50 | n.d. |
| 鄰苯二甲酸二(2-乙基己基)酯 (DEHP) (Di-(2-ethylhexyl) phthalate (DEHP)) | | mg/kg | 50 | n.d. |
| 鄰苯二甲酸二異丁酯 (DIBP) (Diisobutyl phthalate (DIBP)) | | mg/kg | 50 | n.d. |
| 鄰苯二甲酸二異癸酯 (DIDP) (Diisodecyl phthalate (DIDP)) (CAS No.: 26761-40-0, 68515-49-1) | | mg/kg | 50 | n.d. |
| 鄰苯二甲酸二異壬酯 (DINP) (Diisononyl phthalate (DINP)) (CAS No.: 28553-12-0, 68515-48-0) | | mg/kg | 50 | n.d. |
| 鄰苯二甲酸二正辛酯 (DNOP) (Di-n-octyl phthalate (DNOP)) (CAS No.: 117-84-0) | | mg/kg | 50 | n.d. |
| 鄰苯二甲酸二正戊酯 (DNPP) (Di-n-pentyl phthalate (DNPP)) (CAS No.: 131-18-0) | | mg/kg | 50 | n.d. |
| 鄰苯二甲酸二正己酯 (DNHP) (Di-n-hexyl phthalate (DNHP)) (CAS No.: 84-75-3) | | mg/kg | 50 | n.d. |

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| 測試項目 (Test Items) | 測試方法 (Method) | 單位 (Unit) | MDL | 結果 (Result) |
|--|---|--------------|------|----------------|
| | | | | No.1 |
| 六溴環十二烷及所有主要被辨別出的異構物(HBCDD) (α- HBCDD, β- HBCDD, γ- HBCDD) (Hexabromocyclododecane (HBCDD) and all major 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)) | 參考IEC 62321-9: 2021 · 以氣相層析儀/質譜儀分析。(With reference to IEC 62321-9: 2021, analysis was performed by GC/MS.) | mg/kg | 20 | n.d. |
| 氟 (F) (Fluorine (F)) (CAS No.: 14762-94-8) | 參考BS EN 14582: 2016 · 以離子層析儀分析。(With reference to BS EN 14582: 2016, analysis was performed by IC.) | mg/kg | 50 | n.d. |
| 氯 (Cl) (Chlorine (Cl)) (CAS No.: 22537-15-1) | | mg/kg | 50 | n.d. |
| 溴 (Br) (Bromine (Br)) (CAS No.: 10097-32-2) | | mg/kg | 50 | n.d. |
| 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) | 參考CEN/TS 15968: 2010 · 以液相層析串聯質譜儀分析。(With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.) | 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) | | mg/kg | 0.01 | n.d. |
| 銻 (Sb) (Antimony (Sb)) (CAS No.: 7440-36-0) | 參考US EPA 3052: 1996 · 以感應耦合電漿發射光譜儀分析。(With reference to US EPA 3052: 1996, analysis was performed by ICP-OES.) | mg/kg | 2 | 82.3 |
| 鈹 (Be) (Beryllium (Be)) (CAS No.: 7440-41-7) | | mg/kg | 2 | n.d. |

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| 測試項目 (Test Items) | 測試方法 (Method) | 單位 (Unit) | MDL | 結果 (Result) |
|---------------------------------|---|--------------|-----|----------------|
| | | | | No.1 |
| 聚氯乙烯 (Polyvinyl chloride) (PVC) | 參考ASTM E1252: 2021 · 以傅立葉轉換紅外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.) | ** | - | Negative |

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. 全氟辛烷磺酸及其鹽類包含等物質 (PFOS and its salts including) :
CAS No.: 1763-23-1, 2795-39-3, 29457-72-5, 29081-56-9, 70225-14-8, 56773-42-3, 251099-16-8, 307-35-7, 91036-71-4, 4021-47-0 and others.
8. 全氟辛酸及其鹽類包含等物質 (PFOA and its salts including) :
CAS No.: 335-67-1, 335-95-5, 2395-00-8, 335-93-3, 335-66-0, 3825-26-1 and others.
9. 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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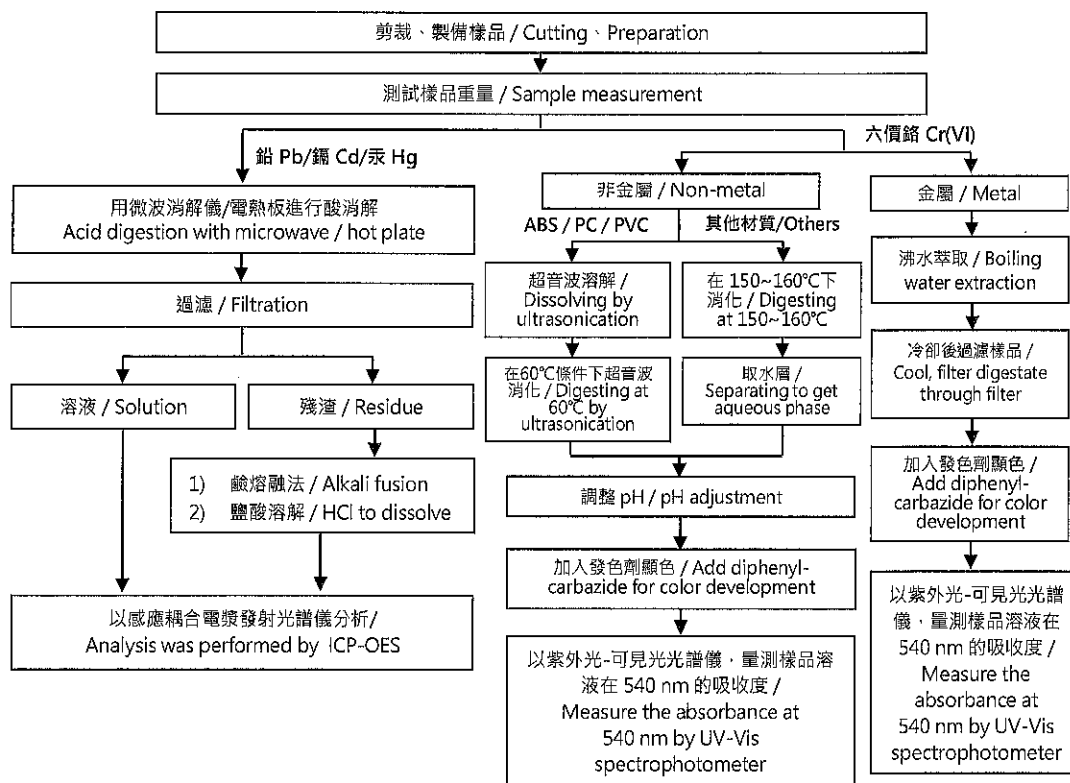
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重金屬流程圖 / Analytical flow chart of heavy metal

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.

(Cr⁶⁺ test method excluded)



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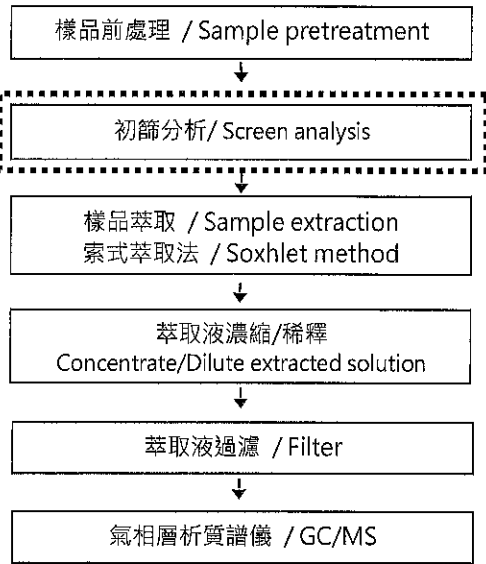
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多溴聯苯/多溴聯苯醌分析流程圖 / Analytical flow chart - PBBs/PBDEs

- 初次測試程序 / First testing process —————>
- 選擇性篩檢程序 / Optional screen process ······->
- 確認程序 / Confirmation process - - - ->



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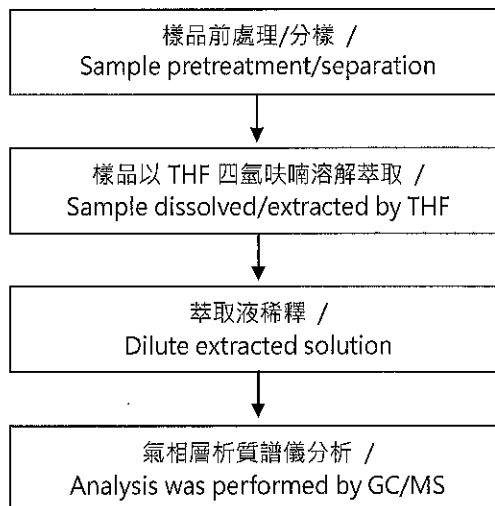
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可塑劑分析流程圖 / Analytical flow chart - Phthalate

【測試方法/Test method: IEC 62321-8】



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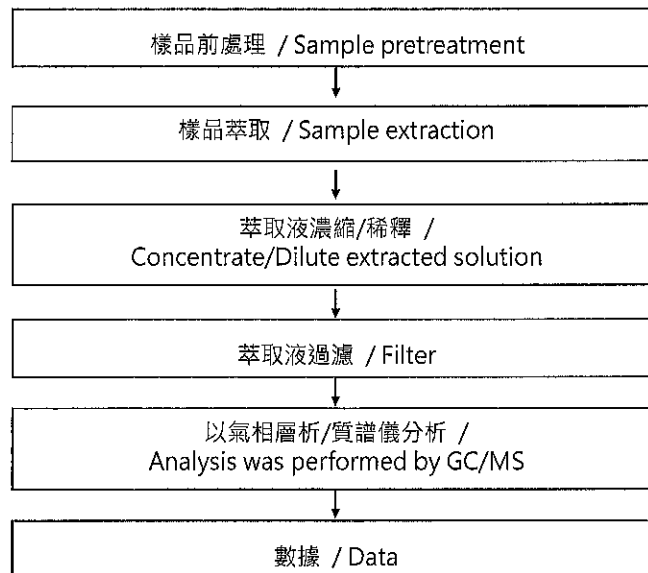
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六溴環十二烷分析流程圖 / Analytical flow chart - HBCDD



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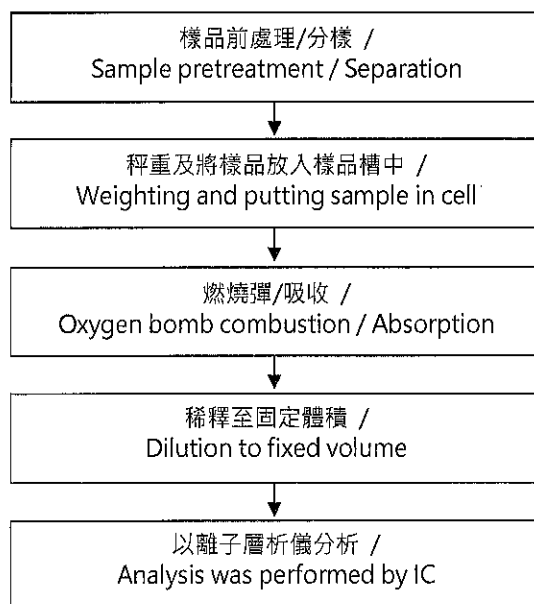
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鹵素分析流程圖 / Analytical flow chart - Halogen



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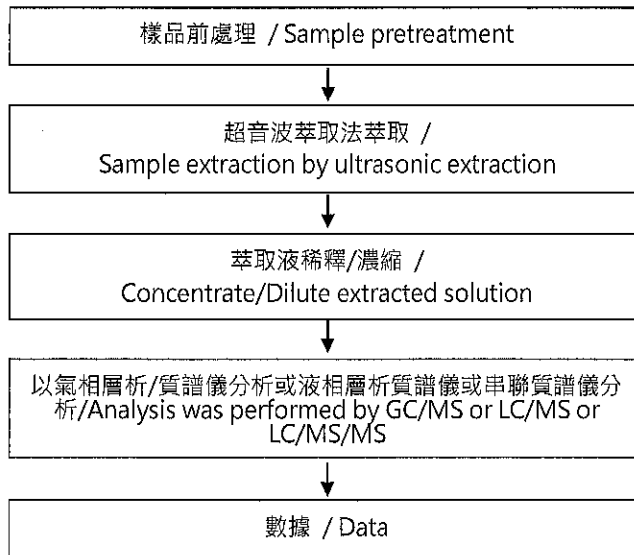
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全氟化合物(包含全氟辛酸/全氟辛烷磺酸/其相關化合物等等)分析流程圖 / Analytical flow chart – PFAS (including PFOA/PFOS/its related compound, etc.)



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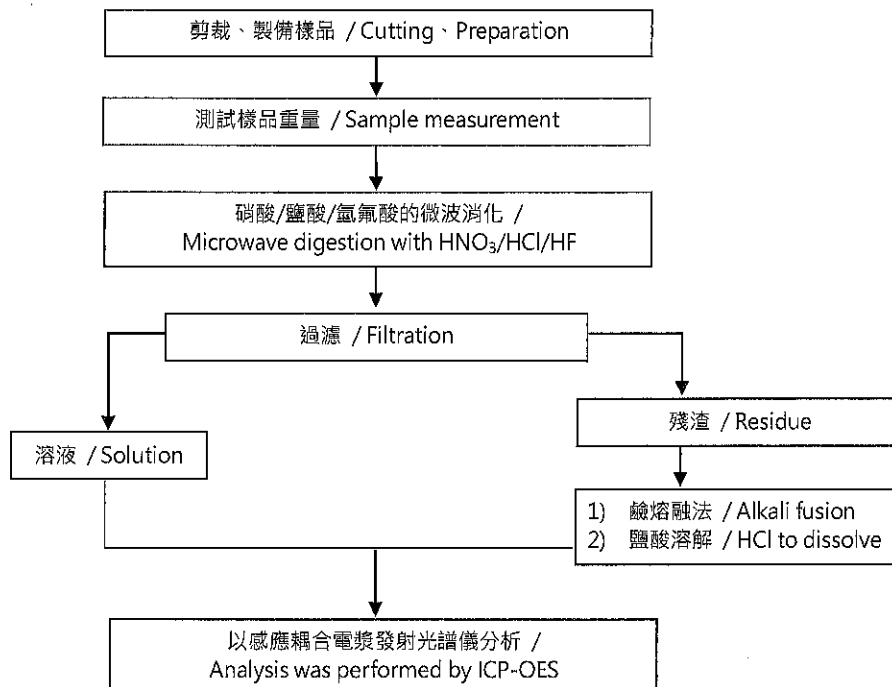
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元素(含重金屬)分析流程圖 / Analytical flow chart of elements (Heavy metal included)

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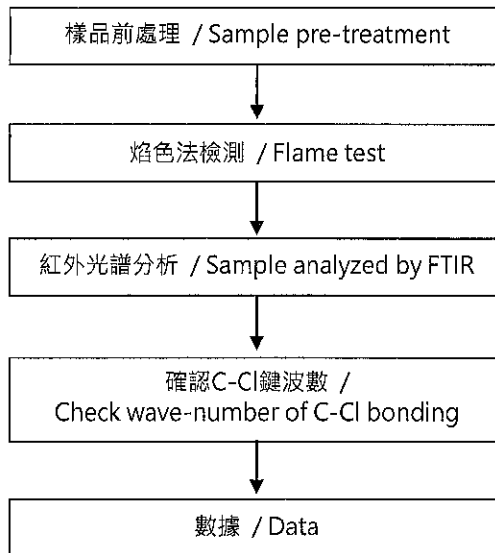
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聚氯乙炔物質判定分析流程圖 / Analysis flow chart - PVC



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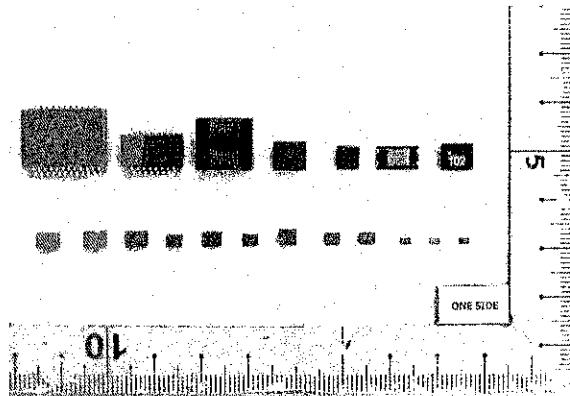
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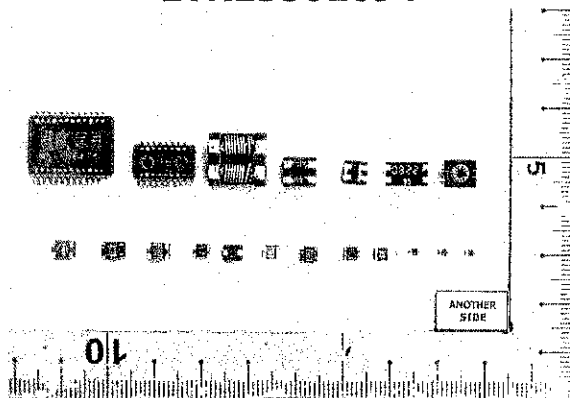
* 照片中如有箭頭標示，則表示為實際檢測之樣品/部位。*

(The tested sample / part is marked by an arrow if it's shown on the photo.)

ETR23302694



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