TAI-TECH TBM03-230500029

LAN Transformer Module

LAN-16J241P1D9

1. Features

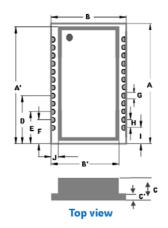
- 1. Low profile, small footprint saves board space and height
- 2. Design for 10G ethernet application
- 3. Pin to Pin compatibility with LAN transformer
- 4. Operating temperature range: -40°C to +85°C
- 5. Storage temperature range: -40°C to +85°C
- 6. 100% Lead (Pb)-Free and RoHS compliant.

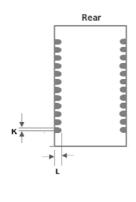


2. Applications

- 1. 10G Base-T, Single Port, Low profile Modules (24 Pin)
- 2. Notebook pc LAN Transformer Module
- 3. Hub switch, Ap router Multi-port LAN Transformer.

3. Dimensions



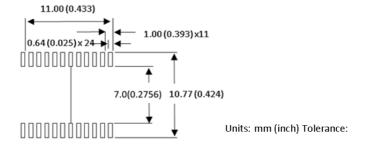


	A(mm)	A'(mm)	B(mm)	B'(mm)	C(mm)	C'(mm)
	16.5±0.25	16.0±0.25	10.3±0.25	9.65±0.25	4.1 max	0.8±0.25
Size	D(mm)	E(mm)	F(mm)	G(mm)	H(mm)	l(mm)
3126	6.75±0.25	4.75±0.25	3.75±0.25	0.4±0.15	1.0±0.15	2.75±0.25
	J(mm)	K(mm)	L(mm)			
	0.65±0.15	0.2±0.075	1.0±0.15			

Tolerance: XX.X0 +/-0.25(mm)

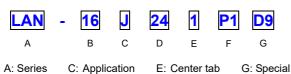
0.XX +/-0.05(mm)

Recommend PC Board Pattern



XX.X0 +/-0.25 (0.010) 0.XX +/-0.05 (0.002)

4. Part Numbering



A: Series B: Long

C: Application D: Pin

E: Center tab

F: Pitch

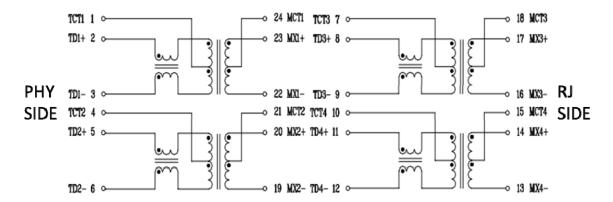
5. Specification

	Part Number OCL (uH Min) (dB Max)		Return Loss (dB min)		Cross talk (dB min)	DCMR(dB Min)		
		@100KHz/0.1V	1~500MHz	1≦f≦40MHz	40≦f≦500MHz	1~500MHz	1~250MHz	250~500MHz
Ī	LAN-16J241P1D9	120	-3.0	-16	-(16-10log ₁₀ (f/40))	-30	-22	-18

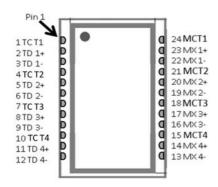
Note:

- 2. Hi-Pot resistance of 1500 VAC for 1 minute
- 3. Recommended: modules should be surface- mounted on the second time(last time) of customer's double-sided PCB to prevent shift of parts.

6. Schematic



7. Pin Define



 TAI-TECH
 TBM03-230500029
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8. Reliability and Test Condition

Item	Performance	Test Condition				
Insertion Loss						
Retuen Loss	Refer to standard electrical characteristics list.	Agilent E5071C				
Cross talk DCMR	4					
	40°C + 95°C (Including colf. temperature rice)					
Operating Temperature	-40℃~+85℃(Including self - temperature rise)					
Storage Temperature	-40°C∼+85°C (Product without taping)	December 15 control of the control o				
Life Test		Preconditioning: Run through Reflow for 3 times. (IPC/JEDEC J-STD-020E Classification Reflow Profiles) Temperature: 85±2°C Duration: 1000±12hrs Measured at room temperature after placing for 24 hrs				
Humidity Resistance Test	Appearance: No damage. Insertion Loss: within spec. Return Loss: within spec.	Preconditioning: Run through Reflow for 3 times. (IPC/JEDEC J-STD-020E Classification Reflow Profiles) Humidity: 85±3% R.H, Temperature: 85℃±2℃ Duration: 1000hrs Min. Bead: with 100% rated current. Inductance: with 10% rated current. Measured at room temperature after placing for 24 hrs				
Thermal shock Test	Appearance : No damage.	Preconditioning: Run through Reflow for 3 times. (IPC/JEDEC J-STD-020E Classification Reflow Profiles) Step1: -40±2°C 30±5min Step2: 85±2°C ≤0.5min Step3: 85±2°C 30±5min Number of cycles: 500 Measured at room temperature after placing for 24 hrs				
Vibration Test	Insertion Loss: within spec. Return Loss: within spec.	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:10g Testing Time: 12 hours(20 minutes, 12 cycles each of 3 orientations)				
Solderability Test	More than 95% of bottom terminal electrode should be covered with solder.	a. Method B, 4 hrs @155°C dry heat @235°C±5°C Test time:5+0/-0.5 seconds. b. Method D category 3. (steam aging 8hours ± 15 min)@ 260°C±5°C Test time: 30+0/-0.5 seconds.				
		Depth: completely cover bottom the termination				
Resistance To Solder Heat Test	Appearance: No damage.	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				
		With the component mounted on a PCB with the device to be tested, apply a 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.				
Terminal Strength Test	Series No. 2(Kg) LAN 1.0(min.)	PCB				

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9. Soldering and Mounting

9-1. 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.

9-1.1 Soldering Reflow:

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

9-1.2 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.)

- Preheat circuit and products to 150°C Use a 20 watt soldering iron with tip diameter of 1.0mm
- 350℃ tip temperature (max) 1.0mm tip diameter (max) Limit soldering time to 4~5 sec.

Fig.1 Soldering Reflow

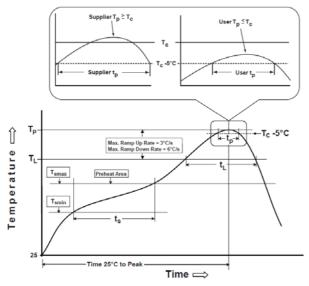
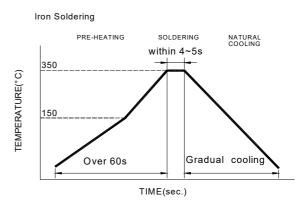


Fig.2 Iron soldering temperature profiles



Iron Soldering times: 1 times max

Reflow times: 3 times max

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.
$\label{eq:Liquidus} \begin{array}{c} \text{Liquidus temperature}(T_L) \\ \text{Time}(t_L) \\ \text{maintained above } T_L \end{array}$	217°C 60-150 seconds
Classification temperature(T _c)	See Table (1.2)
$\label{eq:total_final} \mbox{Time}(t_p) \mbox{ at Tc-} 5^{\circ}\mbox{\mathbb{C}} (\mbox{Tp should be equal to or less than Tc.})$	< 30 seconds
Ramp-down rate(T _p to T _L)	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 (Tc)

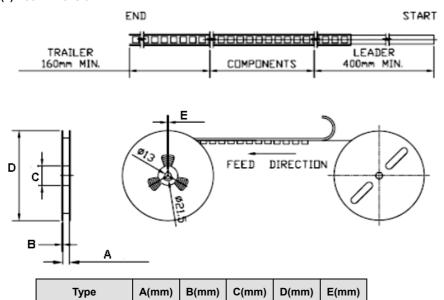
	Package Thickness	Volume mm ³ <350	Volume mm ³ 350-2000	Volume mm ³ >2000
	<1.6mm	260°C	260°C	260°C
PB-Free Assembly	1.6-2.5mm	260°C	250°C	245°C
	≥2.5mm	250°C	245°C	245°C

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

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10. Packaging Information

(1) Reel Dimension



(2) Tape Dimension

LAN-16J241P1D9

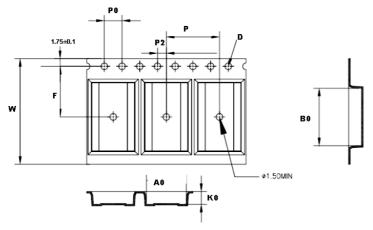
33.5±2.0

2.0±0.15

 φ 100

 φ 330±2

2.5



Series	Bo(mm)	Ao(mm)	Ko(mm)	P(mm)	Po(mm)	P2(mm)	W(mm)	F(mm)	D(mm)
LAN-16J241P1D9	16.80±0.1	10.60±0.1	4.90±0.1	16.00±0.1	4.0±0.1	2.0±0.1	32±0.3	14.2±0.1	1.5±0.1

(3) Packaging Quantity

LAN	LAN-16J241P1D9
Chip / Reel	800

Application Notice

- Storage Conditions(component level)

 To maintain the solderability of terminal electrodes:
- 1. TAI-TECH products meet IPC/JEDEC J-STD-020E standard-MSL, level 1.
- 3. Recommended products should be used within 12 months form 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.





Test Report

號碼(No.): ETR23300844

日期(Date): 10-Mar-2023

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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)

AZ CHIP LAN TRANSFORMER

樣品型號(Style/Item No.)

: LAN \ LAP SERIES

收件日(Sample Receiving Date)

03-Mar-2023

測試期間(Testing Period)

03-Mar-2023 to 10-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 Makager Signed for and on behalf of Suwah SGS TAIWAN LTD. Chemical Laboratory - Taipei



PIN CODE: 791725F9

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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	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 · 以感應耦合電漿發射光	mg/kg	2	n.d.
	譜儀分析。(With reference to IEC 62321-5:			
	2013, analysis was performed by ICP-OES.)			
鉛 (Pb) (Lead (Pb))	參考IEC 62321-5: 2013,以感應耦合電漿發射光	mg/kg	2	n.d.
	譜儀分析。(With reference to IEC 62321-5:			
	2013, analysis was performed by ICP-OES.)			
汞 (Hg) (Mercury (Hg))	參考IEC 62321-4: 2013+ AMD1: 2017·以感應耦	mg/kg	2	n.d.
	合電漿發射光譜儀分析。(With reference to IEC			
	62321-4: 2013+ AMD1: 2017, analysis was			
T	performed by ICP-OES.)			
六價鉻 Cr(VI) (Hexavalent Chromium	參考IEC 62321-7-2: 2017·以紫外光-可見光分光	mg/kg	8	n.d.
Cr(VI))	光度計分析。(With reference to IEC 62321-7-2:	_ -		
	2017, analysis was performed by UV-VIS.)			

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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 (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 <i>.</i> 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)	- 参考IEC 62321-6: 2015,以氣相層析儀/質譜儀分	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)	参与IEC 02321-0. 2013,以無相層和 嚴/員請嚴力析。(With reference to IEC 62321-6: 2015,	mg/kg	1	n,d.
一溴聯苯醚 (Monobromodiphenyl ether)	•	mg/kg	5	n.d.
二溴聯苯醚 (Dibromodiphenyl ether)	Hanaivsis was benorned by GC/M/1	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)			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))		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)	参考IEC 62321-8: 2017・以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017,	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)	analysis was performed by GC/MS.)	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)		mg/kg	50	271
氯 (Cl) (Chlorine (Cl)) (CAS No.: 22537- 15-1)	参考BS EN 14582: 2016,以離子層析儀分析。		50	96.4
溴 (Br) (Bromine (Br)) (CAS No.: 10097- 32-2)	(With reference to BS EN 14582: 2016, analysis was performed by IC.)	mg/kg	50	n.d.
碘 (I) (lodine (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	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)	儀分析。(With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.)	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	n.d.

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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. 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.
- 6. 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.
- 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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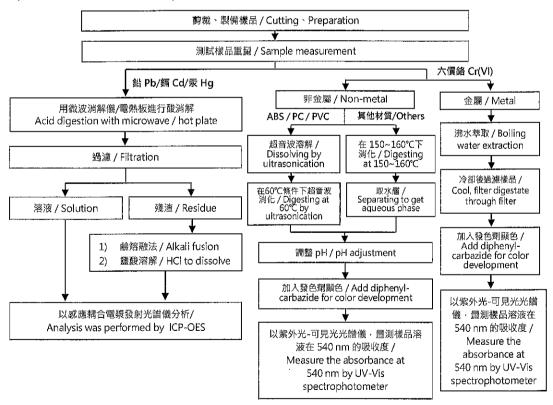
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重金屬流程圖 / Analytical flow chart of heavy metal

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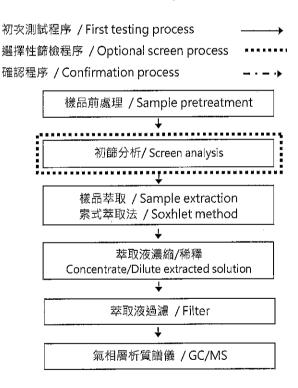
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多溴聯苯/多溴聯苯醚分析流程圖 / Analytical flow chart - PBBs/PBDEs



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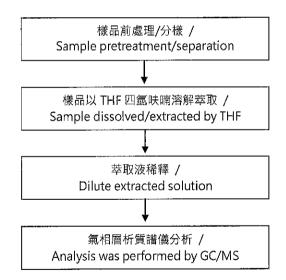
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可塑劑分析流程圖 / Analytical flow chart - Phthalate

【測試方法/Test method: IEC 62321-8】



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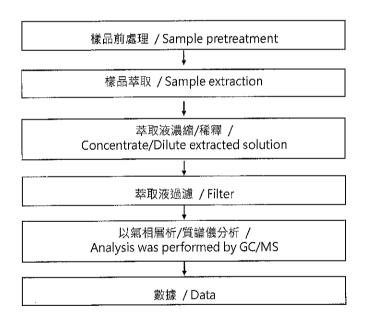
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六溴環十二烷分析流程圖 / Analytical flow chart - HBCDD



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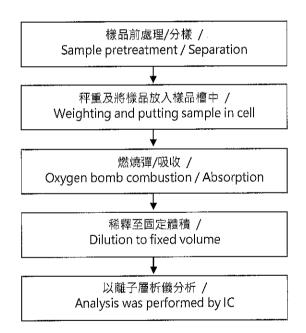
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鹵素分析流程圖 / Analytical flow chart - Halogen



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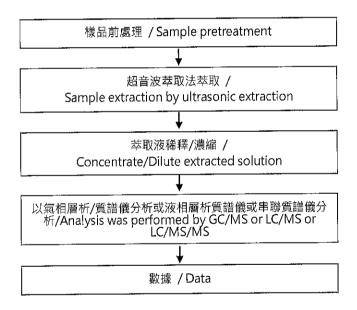
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全氟化合物(包含全氟辛酸/全氟辛烷磺酸/其相關化合物等等)分析流程圖 / Analytical flow chart – PFAS (including PFOA/PFOS/its related compound, etc.)



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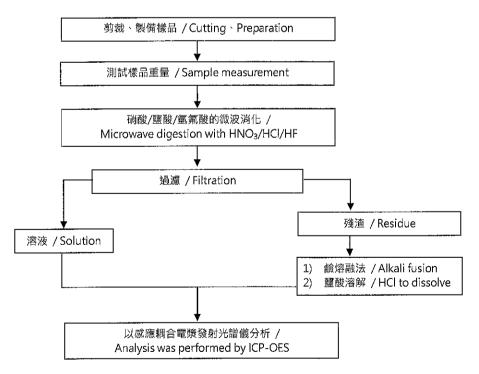
中國·江蘇省·宿遷市·泗洪縣·經濟開發區杭州路南側·建設北路東側 (THE SOUTH HANGZHOU ROAD AND THE EAST JIANSHE ROAD · ECONOMIC DEVELOPMENT ZONE · SIHONG COUNTY · SUQIANCITY · JIANGSU PROVINCE · P,R · CHINA)

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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Test Report

號碼(No.): ETR23300844

日期(Date): 10-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.)

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

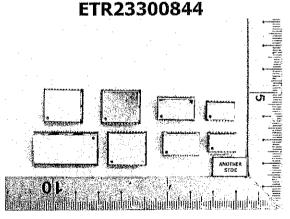
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江蘇省昆山市篷朗昆嘉高科技工業區郭澤路 (GUO-ZE ROAD, KUNJIA HI-TECH INDUSTRIAL PARK, KUN-SHAN, JIANG-SU, CHINA)

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)

* 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.)

ETR23300844



** 報告結尾 (End of Report) **

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