

Specification for Approval

Date: 2023/12/22

Customer:







TAI-TECH P/N:	FCM3216KF-152T07
CUSTOMER P/N:	
DESCRIPTION:	
QUANTITY:	pcs

REMARK:		
Cu	stomer Approval Feedba	ack
	Storiler Approvar i ccube	ICK

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

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Sales Dep.

APPROVED	CHECKED
管哲頎 Eric Guan	蒯青榮

R&D Center

APPROVED	CHECKED	DRAWN
鄧福興	浦冬生	王俞琴

Ferrite Chip Bead(Lead Free)

FCM3216KF-152T07

REV	DATE	DESCRIPTION	APPROVED	CHECKED	DRAW
1.0	13/06/06	變更可靠度條件	楊祥忠	羅培君	張嘉玛
2.0	14/01/24	變更電鍍錫層厚度 3.0um min.=>3.5um min.	楊祥忠	羅培君	張嘉玲
3.0	14/08/01	變更 Reflow 圖示	楊祥忠	羅培君	張嘉玲
3.1	14/08/01	修正包裝帶尺寸	楊祥忠	羅培君	張嘉玛
4.0	16/01/26	增訂可靠度 Thermal shock: (Bead) Step3:125±2℃ 30±5min	楊祥忠	詹偉特	張嘉玲
5.0	17/02/16	修訂 Recommended PC Board Pattern	楊祥忠	詹偉特	張嘉玛
8.0	20/08/01	更新 Reflow 依 IPC EDEC J-STD-020E	鄧福興	浦冬生	王俞琴
9.0	22/12/05	更新可靠度及更正 Reflow 敘述	鄧福興	浦冬生	王俞琴
備					
註					

TAI-TECH KBM01-231200616 P2.

Ferrite Chip Bead(Lead Free)

FCM3216KF-152T07

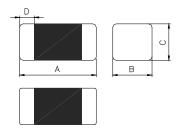
Certificate

Green Partner

1.Features

- 1. Monolithic inorganic material construction.
- 2. Closed magnetic circuit avoids crosstalk.
- 3. S.M.T. type.
- 4. Suitable for reflow soldering.
- 5. Shapes and dimensions follow E.I.A. spec.
- 6. Available in various sizes.
- 7. Excellent solder ability and heat resistance.
- 8. High reliability.
- 9. 100% Lead(Pb) & Halogen-Free and RoHS compliant.
- 10. Operating Temperature: -55~+125°C (Including self-temperature rise)

2. Dimensions



Chip Size				
Α	3.20±0.20			
В	1.60±0.20			
С	1.10±0.20			
D	0.50±0.30			

Units: mm

3.Part Numbering

















B: Dimension

C: Material

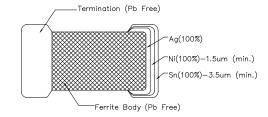
D: Impedance

E: Packaging
F: Rated Current

L x W Lead Free Material $152=1500\,\Omega$

T=Taping and Reel, B=Bulk(Bags)

07=700m/

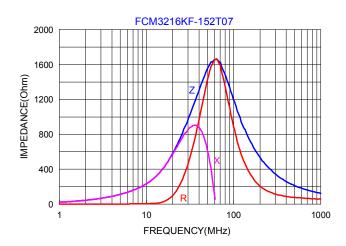


4.Specification

Tai-Tech Part Number	Impedance (Ω)	Test Frequency (Hz)	DC Resistance (Ω) max.	Rated Current (mA) max.
FCM3216KF-152T07	1500±25%	60mV/50M	0.70	700

- Rated current: based on temperature rise test
- In compliance with EIA 595

■ Impedance-Frequency Characteristics



TAI-TECH KBM01-231200616

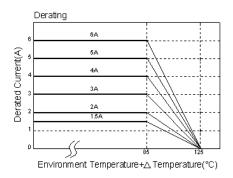
5. Reliability and Test Condition

Item	Performance				Те	st Cond	dition	
Series No.	FCB FCM HCB	GHB	FCA					
Operating Temperature	-55∼+125 $^{\circ}$ C (Including self-temperatu	re rise)						
Transportation Storage Temperature	-55~+125℃ (on board)			For long storage conditions, please see the Application Notice				
Impedance (Z)	Refer to standard electrical characteristics list			Agilent42 Agilent E Agilent42 Agilent16	4991 287			
DC Resistance	refer to startage discrete startages notes	Agilent 4						
Rated Current				DC Powe Over Rat some risk	ed Curr		ements, the	ere will be
Temperature Rise Test	Rated Current < 1A ΔT 20 ℃ Max Rated Current ≧ 1A ΔT 40 ℃ Max			2. Tempe		owed DC neasured	current. by digital su	urface
Life test	Appearance: no damage. Impedance: within±15%of initial value. RDC: within ±15% of initial value and shall not	exceed the specific	cation value	times.(IF Reflow P Temperat Applied of Duration: Measurer for 24±2 I Precondi times.(IF Reflow P Humidity: Temperat Duration: ent → Inc	PC/JED rofiles) ture: 12 current: 1000± d at rohrs. PC/JED rofiles): 85±3% ture: 85 1000hr ductand	5±2°C rated curril2hrs. om tempe Run thre EC J-STD 5R.H. ±2°C. sMin.Beace: with	ough reflictions of the country of t	er placing ow for 3 ssification ratedcurr
Thermal shock	Appearance: no damage. Impedance: within±15%of initial value. RDC: within ±15% of initial value and shall not	exceed the specific	cation value	times.(IF Reflow P Condition Step1: -5 Step2: 12 Step3: 12 Number of	tioning: PC/JED rofiles) n for 1 c 5±2°C 25±2°C of cycle d at ro	ycle 30±5 ≤ 0.5 30±5min s: 500	imin	ssification
Vibration	Appearance: No damage. Impedance: within±15% of initial value RDC: within ±15% of initial value and shall not	exceed the specific	cation value	times.(IF Reflow P Oscillatio for 20 min Equipment Total Amp	PC/JED rofiles) in Freq nutes nt: Vi olitude:	uency: 10 bration cho 10g 2 hours(20	ough reflo I-020E Clas 0Hz ~ 2KHz ecker 0 minutes, 2	ssification z ~ 10Hz
Bending	Appearance: No damage. Impedance: within±10% of initial value RDC: within ±15% of initial value and shall not	exceed the specific	cation value	following >=0805ind <0805ind Bending >=0805ind <0805ind	dimens nch(201 ch(2012 depth: nch(201 ch(2012	ions: 2mm):40x	ım	
				Test cor	ndition			
Shock	Appearance : No damage. Impedance : within ±10% of initial value	avaged the one-if-	ootion valus	Туре	Peak Value (g's)	Normal duration (D) (ms)	Wave form	Velocity change (Vi)ft/sec
	RDC: within ±15% of initial value and shall not	exceed the specific	alion value	SMD	50 50	11	Half-sine Half-sine	11.3
				a.Method	Ι В,	4 hrs (@155°C 0	dry heat
Solderability	More than 95% of the terminal electrode should	be covered with so	lder.	± 15 min)	@ 260		steam agin	g 8hours

Item	Performance	Test Condition		
		Number of heat cycles: 1		
Resistance to Soldering	Appearance : No damage.	Temperature (s) Time ramp/immersion and emersion rate		
Heat	Impedance: within±15% of initial value RDC: within ±15% of initial value and shall not exceed the specification value	260 ±5 (solder temp) 10 ±1 25mm/s ±6 mm/s		
		Depth: completely cover the termination		
Terminal strength	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) Component mounted on a PCB apply a force >0805inch(2012mm):1kg <=0805inch(2012mm):0.5kg 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 shock the component being tested.		

**Derating Curve

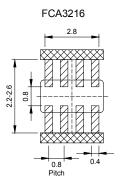
For the ferrite chip bead which withstanding current over 1.5A, as the operating temperature over $85^{\circ}\mathrm{C}$, the derating current information is necessary to consider with. For the detail derating of current, please refer to the Derated Current vs. Operating Temperature curve.



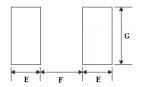
6. Soldering and Mounting

6-1. Recommended PC Board Pattern

Chip Size						Pattern ow Sold	• . • .	
Series	Type	A(mm)	B(mm)	C(mm)	D(mm)	E(mm)	F(mm)	G(mm)
FCB	1005	1.0±0.10	0.50±0.10	0.50±0.10	0.25±0.10	0.50	0.40	0.60
FCM	1608	1.6±0.15	0.80±0.15	0.80±0.15	0.30±0.20	0.80	0.85	0.95
нсв	2012	2.0±0.20	1.25±0.20	0.85±0.20	0.50±0.30	1.05	1.05 1.00	1.45
GHB	2012	2.0±0.20	1.25±0.20	1.25±0.20	0.50±0.30	1.05		
FCI	<mark>3216</mark>	3.2±0.20	1.60±0.20	1.10±0.20	0.50±0.30	<mark>1.05</mark>	<mark>2.20</mark>	<mark>1.80</mark>
FHI	3225	3.2±0.20	2.50±0.20	1.30±0.20	0.50±0.30	1.05	2.20	2.70
FCH	4516	4.5±0.20	1.60±0.20	1.60±0.20	0.50±0.30	1.05	3.30	1.80
нсі	4532	4.5±0.20	3.20±0.20	1.50±0.20	0.50±0.30	1.05	3.30	3.40



Land
Solder Resist



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.

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6-2.1 Soldering Reflow:

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

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.)

- \bullet Preheat circuit and products to 150 $\!\!\!\!\!\!^{\circ}_{\circ}$
- Never contact the ceramic with the iron tip • 1.0mm tip diameter (max)
- ${\boldsymbol \cdot}$ Use a 20 watt soldering iron with tip diameter of 1.0mm
- Limit soldering time to 4~5sec.

Fig.1 Soldering Reflow

• 350°C tip temperature (max)

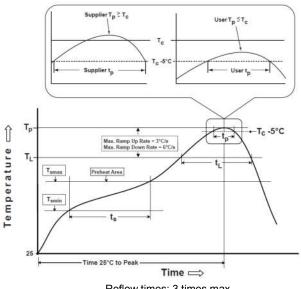
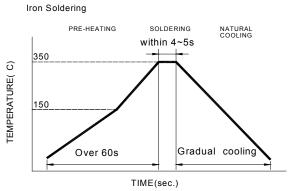


Fig.2 Iron soldering temperature profiles



Iron Soldering times: 1 times max

Reflow times: 3 times max

Table (1.1): Reflow Profiles

Profile Type:	Pb-Free Assembly
$\label{eq:continuous_series} \begin{split} & - \text{Temperature Min}(T_{\text{smin}}) \\ & - \text{Temperature Max}(T_{\text{smax}}) \\ & - \text{Time}(t_{\text{s}}) \text{from}(T_{\text{smin}} \text{ to } T_{\text{smax}}) \end{split}$	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°C 60-150 seconds
Classification temperature(T _c)	See Table (1.2)
$\label{eq:top} \mbox{Time}(t_p) \mbox{ at Tc-} 5^\circ \!$	< 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 •

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:

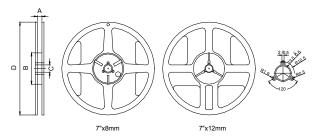
Minimum fillet height = soldering thickness + 25% product height

Upper limit Recommendable

TAI-TECH KBM01-231200616 P6.

7. Packaging Information

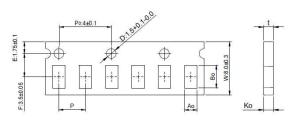
7-1. Reel Dimension



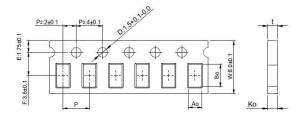
Type		A(mm)	B(mm)	C(mm)	D(mm)
	<mark>7"x8mm</mark>	9.0±0.5	<mark>60±2</mark>	13.5±0.5	<mark>178±2</mark>
7"x12mm		13.5±0.5	60±2	13.5±0.5	178±2

7-2.1 Tape Dimension / 8mm

■Material of taping is paper

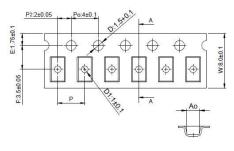


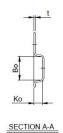
Size	Bo(mm)	Ao(mm)	Ko(mm)	P(mm)	t(mm)
100505	1.12±0.03	0.62±0.03	0.60±0.03	2.0±0.05	0.60±0.03



Size	Bo(mm)	Ao(mm)	Ko(mm)	P(mm)	t(mm)	
160808	1.80±0.05	0.96+0.05/-0.03	0.95±0.05	4.0±0.10	0.95±0.05	
201209	2.10±0.05	1.30±0.05	0.95±0.05	4.0±0.10	0.95±0.05	

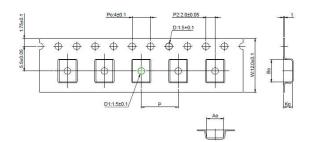
■Material of taping is plastic





Size	Bo(mm)	Ao(mm)	Ko(mm)	P(mm)	t(mm)	D1(mm)
201212	2.10±0.10	1.28±0.10	1.28±0.10	4.0±0.10	0.22±0.05	1.0±0.10
<mark>321611</mark>	3.35±0.10	1.75±0.10	1.25±0.10	4.0±0.10	0.23±0.05	1.0±0.10
322513	3.42±0.10	2.77±0.10	1.55±0.10	4.0±0.10	0.22±0.05	1.0±0.10
321609	3.40±0.10	1.77±0.10	1.04±0.10	4.0±0.10	0.22±0.05	1.0±0.10

7-2.2 Tape Dimension / 12mm



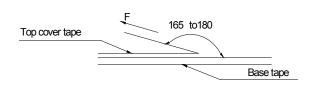
	Size Bo(mm)		Ao(mm)	Ko(mm)	P(mm)	t(mm)	D1(mm)
_	451616	4.70±0.10	1.75±0.10	1.75±0.10	4.0±0.10	0.24±0.05	1.5±0.10
	453215	4.70±0.10	3.45±0.10	1.60±0.10	8.0±0.10	0.24±0.05	1.5±0.10

TAI-TECH KBM01-231200616 P7.

7-3. Packaging Quantity

Chip Size	453215	451616	322513	<mark>321611</mark>	321609	201212	201209	160808	100505
Chip / Reel	1000	2000	2500	<mark>3000</mark>	3000	2000	4000	4000	10000
Inner box	4000	8000	12500	<mark>15000</mark>	15000	10000	20000	20000	50000
Middle box	20000	40000	62500	<mark>75000</mark>	75000	50000	100000	100000	250000
Carton	40000	80000	125000	<mark>150000</mark>	150000	100000	200000	200000	500000

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-020E 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.





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.)

慶邦電子元器件 (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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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

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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)

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)	參考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-932 (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/MS.)	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	11.0.
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 (CI) (Chlorine (CI)) (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 salts (PFOS and its salts) (CAS No.: 1763-23-1 and its salts)	全氟辛基磺醯氟 (POSF) Perfluorooctane sulfonyl fluoride (POSF)	307-35-7
	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 (PFOA and its salts) (CAS No.: 335-67-1 and its salts)	全氟辛酸鈉 (PFOA-Na) Sodium perfluorooctanoate (PFOA-Na)	335-95-5
	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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西北臺慶科技股份有限公司 (TAI-TECH ADVANCED ELECTRONICS CO., LTD.)

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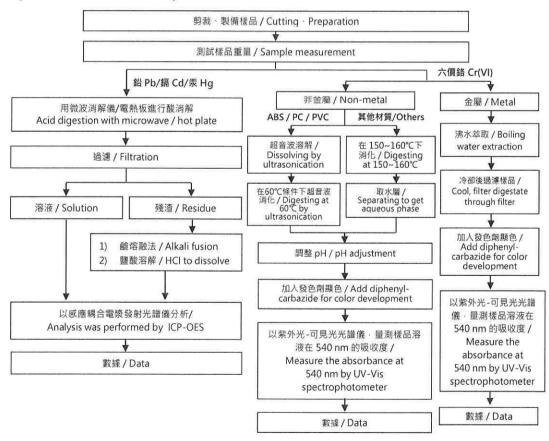
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重金屬流程圖 / Analytical flow chart of heavy metal

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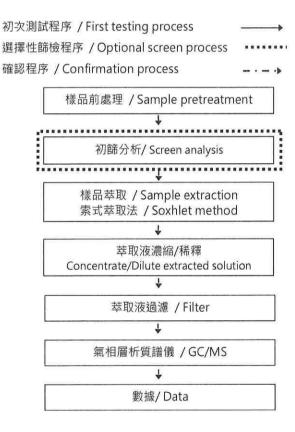
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多溴聯苯/多溴聯苯醚分析流程圖 / Analytical flow chart - PBBs/PBDEs



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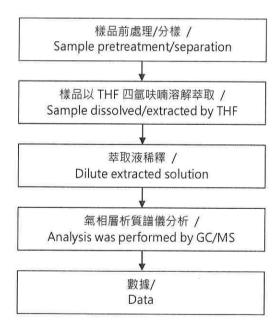
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可塑劑分析流程圖 / Analytical flow chart - Phthalate

【測試方法/Test method: IEC 62321-8】



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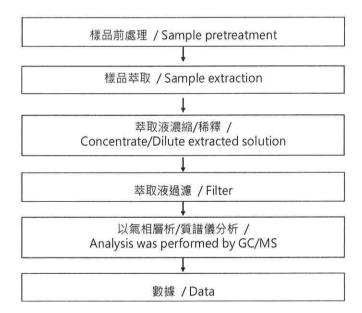
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六溴環十二烷分析流程圖 / Analytical flow chart - HBCDD



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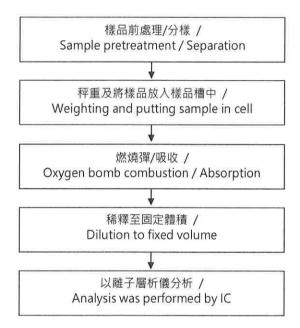
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鹵素分析流程圖 / Analytical flow chart - Halogen



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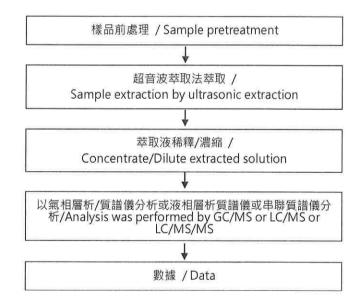
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全氟化合物(包含全氟辛酸/全氟辛烷磺酸/其相關化合物等等)分析流程圖 / Analytical flow chart – PFAS (including PFOA/PFOS/its related compound, etc.)



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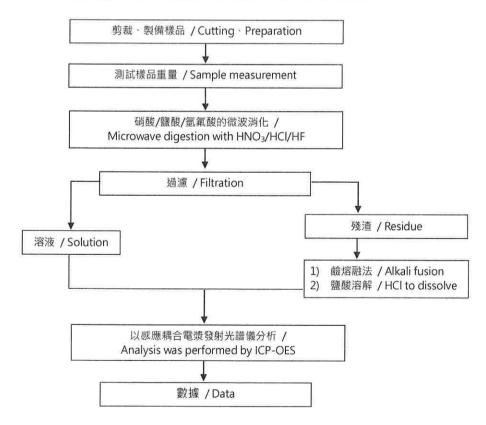
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元素(含重金屬)分析流程圖 / Analytical flow chart of elements (Heavy metal included)

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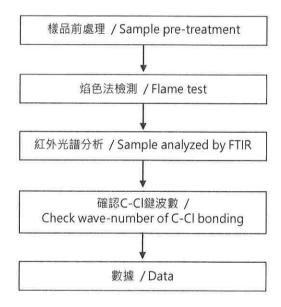
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聚氯乙烯物質判定分析流程圖 / Analysis flow chart - PVC



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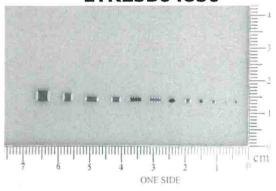
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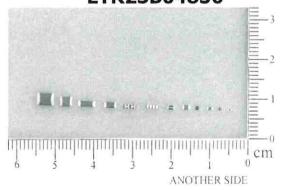
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* 照片中如有箭頭標示,則表示為實際檢測之樣品/部位. * (The tested sample / part is marked by an arrow if it's shown on the photo.)

ETR23B04850



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