Form No: T00752-2-0000-KBM01-190900383

Specification for Approval

Date: 2019/9/19

Halogen-free RoHS Certificate of Green Partner

Customer : 天河星

TAI-TECH P/N: HCB3216KV-601T20

CUSTOMER P/N:

DESCRIPTION:

QUANTITY: pcs

REMARK:		
Customer Approval Feedback		

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TAI-TECH Advanced Electronics Co., Ltd

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High Current Ferrite Chip Bead(Lead Free) HCB3216KV-601T20

ECN HISTORY LIST

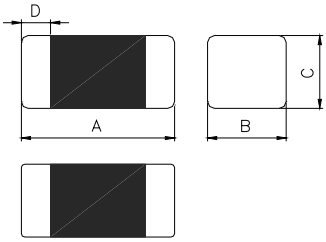
REV	DATE	DESCRIPTION	APPROVED	CHECKED	DRAWN
1.0	14/01/24	變更電鍍錫層厚度 3.0um min.=>3.5um min.	楊祥忠	羅培君	張嘉玲
2.0	14/08/01	變更 Reflow 圖示	楊祥忠	羅培君	張嘉玲
2.1	14/08/01	修正包裝帶尺寸	楊祥忠	羅培君	張嘉玲
3.0	16/01/26	修訂下列可靠度溫度同 Operating Temperature 1.High Temperature Exposure(Storage) 2.High Temperature Operational Life 3.Thermal shock 4.Temperature Cycling	楊祥忠	詹偉特	張嘉玲
4.0	17/02/16	修訂 Recommended PC Board Pattern	楊祥忠	詹偉特	張嘉玲
備註					

High Current Ferrite Chip Bead(Lead Free) HCB3216KV-601T20

1.Features

1. Monolithic inorganic material construction.
2. Closed magnetic circuit avoids crosstalk.
3. Suitable for reflow soldering.
4. Shapes and dimensions follow E.I.A. spec.
5. Available in various sizes.
6. Excellent solder ability and heat resistance.
7. High reliability. Reliability test meet AEC-Q200.
8. 100% Lead(Pb) & Halogen-Free and RoHS compliant.
9. Low DC resistance structure of electrode to prevent wasteful electric power consumption.
10. Operating Temperature: -55~+150℃(Including self-temperature rise)

2.Dimensions



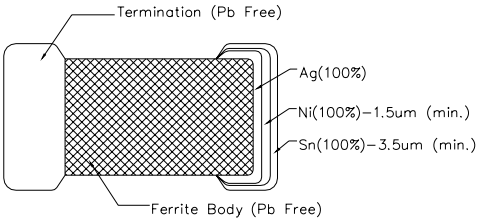
Chip Size	
A	3.20±0.20
B	1.60±0.20
C	1.10±0.20
D	0.50±0.30

Units: mm

3.Part Numbering

HCB	3216	K	V	-	601	T	20
A	B	C	D		E	F	G

A: Series
B: Dimension L x W
C: Material Lead Free Material
D: Category Code V=Vehicle
E: Impedance 601=600Ω
F: Packaging T=Taping and Reel, B=Bulk(Bags)
G: Rated Current 20=2000mA

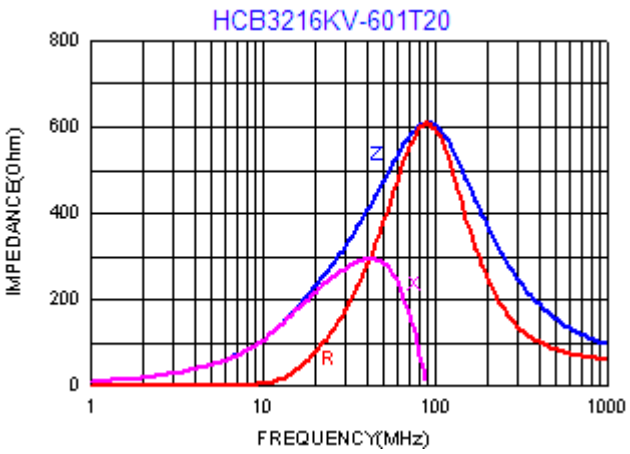


4.Specification

Tai-Tech Part Number	Impedance (Ω)	Test Frequency (Hz)	DC Resistance (Ω) max.	Rated Current (mA) max.
HCB3216KV-601T20	600±25%	60mV/100M	0.10	2000

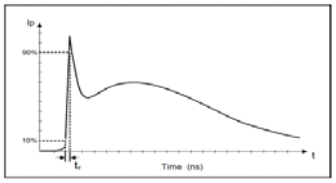
- Rated current: based on temperature rise test
- In compliance with EIA 595

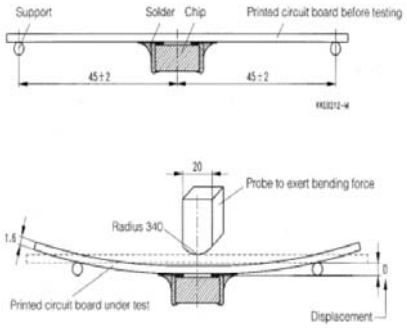
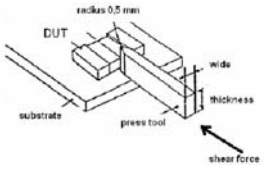
■ Impedance-Frequency Characteristics



5. Reliability and Test Condition

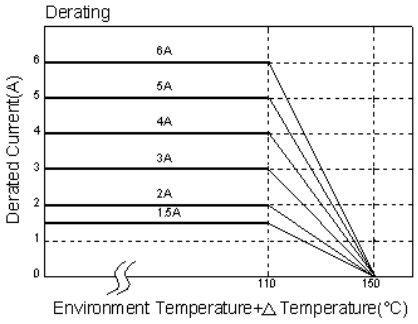
Item	Performance			Test Condition
Series No.	FCB	FCM	HCB	--
Operating Temperature	-55~+150℃ (Including self-temperature rise)			--
Transportation Storage Temperature	-55~+150℃ (on board)			For long storage conditions, please see the Application Notice
Impedance (Z)	Refer to standard electrical characteristics list			Agilent4291 Agilent E4991 Agilent4287 Agilent16192
DC Resistance				Agilent 4338
Rated Current				DC Power Supply Over Rated Current requirements, there will be some risk
Temperature Rise Test	Rated Current < 1A ΔT 20℃Max Rated Current ≧ 1A ΔT 40℃Max			1. Applied the allowed DC current. 2. Temperature measured by digital surface Thermometer.
High Temperature Exposure(Storage)	Appearance：No damage. Impedance：within±15% of initial value Inductance：within±10% of initial value Q：Shall not exceed the specification value. RDC：Within ±15% of initial value and shall not exceed the specification value			Preconditioning:Run through IR reflow for 2 times.(IPC/JEDEC J-STD-020D Classification Reflow Profiles Temperature：150±2℃ Duration ：1000hrs Min. Measured at room temperature after placing for 24±2 hrs
Temperature Cycling				Preconditioning:Run through IR reflow for 2 times.(IPC/JEDEC J-STD-020D Classification Reflow Profiles Condition for 1 cycle Step1：-55±2℃ 30min Min Step2：150±2℃ transition time 1min MAX. Step3：150±2℃30min Min. Step4：Low temp. transition time 1min MAX. Number of cycles：1000 Measured at room temperature after placing for 24±2 hrs
Biased Humidity **（AEC-Q200）**	Appearance：No damage. Impedance：within±15% of initial value Inductance：within±10% of initial value Q：Shall not exceed the specification value. RDC：Within ±15% of initial value and shall not exceed the specification value			Preconditioning:Run through IR reflow for 2 times.(IPC/JEDEC J-STD-020D Classification Reflow Profiles Humidity :85±3%RH. Temperature :85±2℃. Duration :1000 hrs Min. Measured at room temperature after placing for 24±2 hrs
High Temperature Operational Life				Preconditioning:Run through IR reflow for 2 times.(IPC/JEDEC J-STD-020D Classification Reflow Profiles Temperature：150±2℃ Duration ：1000hrs Min. with 100% rated current. Measured at room temperature after placing for 24±2 hrs
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	Appearance：No damage.			Add aqueous wash chemical - OKEM clean or equivalent.

<table>
<tr><th>Item</th><th>Performance</th><th>Test Condition</th></tr>
<tr><td>Mechanical Shock</td><td rowspan="3">Appearance：No damage.
Impedance：within±15% of initial value
Inductance：within±10% of initial value
Q：Shall not exceed the specification value.
RDC：Within ±15% of initial value and shall not exceed the specification value</td><td>Preconditioning:Run through IR reflow for 2 times.(IPC/JEDEC J-STD-020D Classification Reflow Profiles
Test condition:
<table>
<tr><th>Type</th><th>Peak alue (g's)</th><th>Normal duration (D) (ms)</th><th>Wave form</th><th>Velocity change (Vi)ft/sec</th></tr>
<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>
</table>
3 shocks in each direction along 3 perpendicular axes.</td></tr>
<tr><td>Vibration</td><td>Preconditioning:Run through IR reflow for 2 times.(IPC/JEDEC J-STD-020D 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)。</td></tr>
<tr><td>Resistance to Soldering Heat</td><td>(MIL-STD-202 Condition K)
Number of heat cycles: 3
<table>
<tr><th>Temperature (°C)</th><th>Time (s)</th><th>Temperature ramp/immersion and emersion rate</th></tr>
<tr><td>250 ±5 (solder temp)</td><td>30 ±5</td><td>1℃/s-4℃/s;time above 183℃,90s-120s</td></tr>
</table></td></tr>
<tr><td>Thermal shock</td><td>Appearance：No damage.
Impedance：within±15% of initial value
Inductance：within±10% of initial value
Q：Shall not exceed the specification value.
RDC：Within ±15% of initial value and shall not exceed the specification value</td><td>Preconditioning:Run through IR reflow for 2 times.(IPC/JEDEC J-STD-020D Classification Reflow Profiles
Condition for 1 cycle
Step1：-55±2℃ 15±1min
Step2：150±2℃ within 20 Sec.
Step3：150±2℃ 15±1min
Number of cycles： 300
Measured at room temperature after placing for 24±2hrs</td></tr>
<tr><td>ESD</td><td>Appearance：No damage.</td><td> 
</td></tr>
<tr><td>Solder ability</td><td>More than 95% of the terminal electrode should be covered with solder.</td><td>a.MethodB,4hrs@155°Cdryheat @235°C±5°C
b. Method B @ 215°C±5°C category 3.(8hours ± 15 min)
c. Method D category 3. (8hours ± 15 min)@ 260°C±°C
Preheat: 150℃,60sec.
Solder: Sn96.5%-Ag3%-Cu0.5%
Solder temperature : 245±5℃
Flux for lead free: Rosin. 9.5%
Dip time: 4±1sec.
Depth: completely cover the termination.</td></tr>
<tr><td>Electrical Characterization</td><td>Refer Specification for Approval</td><td>Summary to show Min, Max, Mean and Standard deviation</td></tr>
<tr><td>Flammability</td><td>Electrical Test not required.</td><td>V-0 or V-1 are acceptable.</td></tr>
</table>

Item	Performance		Test Condition
Board Flex	Appearance：No damage.		Preconditioning:Run through IR reflow for 2 times.(IPC/JEDEC J-STD-020D 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.
Terminal strength	Appearance：No damage.		Preconditioning:Run through IR reflow for 2 times.(IPC/JEDEC J-STD-020D 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 thecomponent being tested.

****Derating Curve**

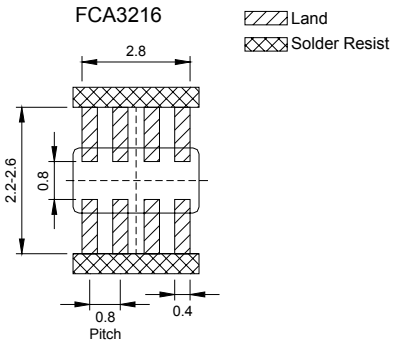
For the ferrite chip bead which withstanding current over 1.5A, as the operating temperature over 110℃, the derating current information is necessary to consider with. For the detail derating of current, please refer to the Derated Current vs. Operating Temperature curve.

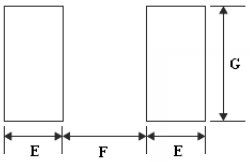


6.Soldering and Mounting

6-1. Recommended PC Board Pattern

Chip Size						Land Patterns For Reflow Soldering		
Series	Type	A(mm)	B(mm)	C(mm)	D(mm)	E(mm)	F(mm)	G(mm)
FCB FCM HCB GHB FCI FHI FCH HCI	1005	1.0±0.10	0.50±0.10	0.50±0.10	0.25±0.10	0.50	0.40	0.60
	1606	1.6±0.15	0.80±0.15	0.60±0.15	0.30±0.20	0.80	0.85	0.95
	1608	1.6±0.15	0.80±0.15	0.80±0.15	0.30±0.20	0.80	0.85	0.95
	2012	2.0±0.20	1.25±0.20	0.85±0.20	0.50±0.30	1.05	1.00	1.45
		2.0±0.20	1.25±0.20	1.25±0.20	0.50±0.30			
	3216	3.2±0.20	1.60±0.20	1.10±0.20	0.50±0.30	1.05	2.20	1.80
	3225	3.2±0.20	2.50±0.20	1.30±0.20	0.50±0.30	1.05	2.20	2.70
	4516	4.5±0.20	1.60±0.20	1.60±0.20	0.50±0.30	1.05	3.30	1.80
	4532	4.5±0.20	3.20±0.20	1.50±0.20	0.50±0.30	1.05	3.30	3.40





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. The 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.

Note.

If wave soldering is used ,there will be some risk..

Re-flow soldering temperatures below 240 degrees, there will be unwitting risk

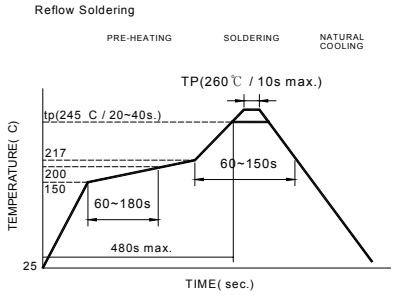
6-2.1 Lead Free Solder re-flow:

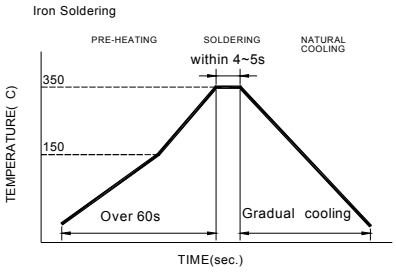
Recommended temperature profiles for lead free re-flow soldering in Figure 1. (Refered to J-STD-020C)

6-2.2 Soldering Iron :

Products attachment with a soldering iron is discouraged due to the inherent process control limitations. If a soldering iron must be employed the following precautions are recommended. for Iron Soldering in Figure 2.

- Preheat circuit and products to 150℃
- Never contact the ceramic with the iron tip
- 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 4~5sec.





Reflow times: 3 times max

Iron Soldering times: 1 times max

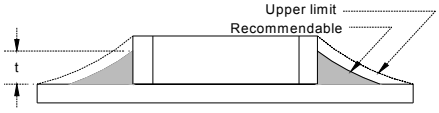
Fig.1

Fig.2

6-2.3 Solder Volume:

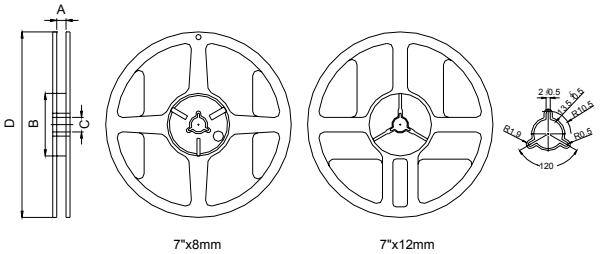
Accordingly increasing the solder volume, the mechanical stress to product is also increased. Exceeding solder volume may cause the failure of mechanical or electrical performance. Solder shall be used not to be exceed as shown in right side:

Minimum fillet height = soldering thickness + 25% product height



7. Packaging Information

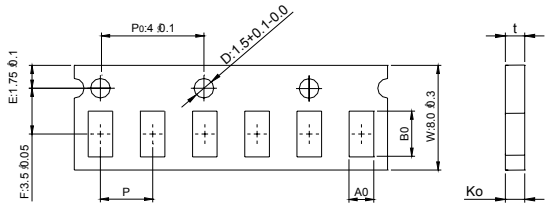
7-1. Reel Dimension



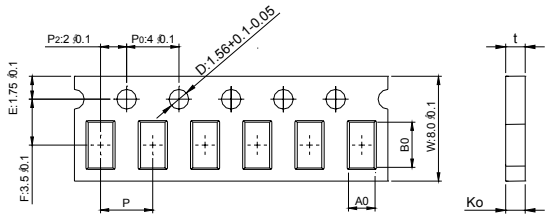
Type	A(mm)	B(mm)	C(mm)	D(mm)
7”x8mm	9.0±0.5	60±2	13.5±0.5	178±2
7”x12mm	13.5±0.5	60±2	13.5±0.5	178±2

7-2.1 Tape Dimension / 8mm

■Material of taping is paper

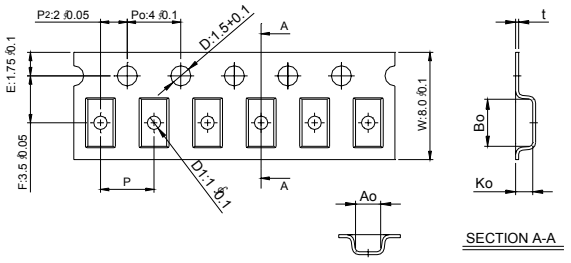


Size	Bo(mm)	Ao(mm)	Ko(mm)	P(mm)	t(mm)
100505	1.12±0.03	0.62±0.03	0.60±0.03	2.0±0.05	0.60±0.03



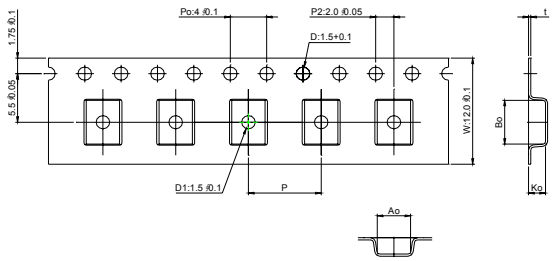
Size	Bo(mm)	Ao(mm)	Ko(mm)	P(mm)	t(mm)
160806	1.78±0.03	0.97±0.03	0.75±0.03	4.0±0.10	0.75±0.03
160808	1.80±0.05	0.96+0.05/-0.03	0.95±0.05	4.0±0.10	0.95±0.05
201209	2.10±0.05	1.30±0.05	0.95±0.05	4.0±0.10	0.95±0.05

■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
321611	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

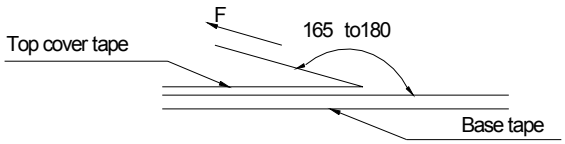


Size	Bo(mm)	Ao(mm)	Ko(mm)	P(mm)	t(mm)	D1(mm)
451616	4.70±0.10	1.75±0.10	1.75±0.10	4.0±0.10	0.24±0.05	1.5±0.10
453215	4.70±0.10	3.45±0.10	1.60±0.10	8.0±0.10	0.24±0.05	1.5±0.10

7-3. Packaging Quantity

Chip Size	453215	451616	322513	321611	321609	201212	201209	160808	160806	100505
Chip / Reel	1000	2000	2500	3000	3000	2000	4000	4000	4000	10000
Inner box	4000	8000	12500	15000	15000	10000	20000	20000	20000	50000
Middle box	20000	40000	62500	75000	75000	50000	100000	100000	100000	250000
Carton	40000	80000	125000	150000	150000	100000	200000	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 (hPa)	Tearing Speed mm/min
5~35	45~85	860~1060	300

Application Notice

・Storage Conditions(component level)
To maintain the solderability of terminal electrodes:
1. TAI-TECH products meet IPC/JEDEC J-STD-020D standard-MSL, level 1.
2. Temperature and humidity conditions: Less than 40℃ 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.

簽名有效
For Question Please Contact with SGS
www.sgs.com.tw

測試報告
Test Report

號碼(No.) : CE/2018/C0389　日期(Date) : 2018/12/11　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/on behalf of the applicant as):

樣品名稱(Sample Description)	:	FERRITE CHIP BEAD、FERRITE CHIP INDUCTOR、ARRAY、MCF、MCM、YMV SERIES
樣品型號(Style/Item No.)	:	FERRITE CHIP BEAD、FERRITE CHIP INDUCTOR、ARRAY、MCF、MCM、YMV SERIES
收件日期(Sample Receiving Date)	:	2018/12/04
測試期間(Testing Period)	:	2018/12/04 to 2018/12/11

==========

測試結果(Test Results) : 請參閱下一頁 (Please refer to following pages).

SGS TAIWAN LTD

Troy Chang / Manager - Tech
Signed for and on behalf of
SGS TAIWAN LTD.
Chemical Laboratory - Taipei

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測試結果(Test Results)

測試部位(PART NAME)No.1　:　整體混測 (MIXED ALL PARTS)

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測極限值 (MDL)	結果 (Result) No.1
鎘 / Cadmium (Cd)	mg/kg	參考IEC 62321-5 (2013)，以感應耦合電漿原子發射光譜儀檢測. / With reference to IEC 62321-5 (2013) and performed by ICP-AES.	2	n.d.
鉛 / Lead (Pb)	mg/kg		2	n.d.
汞 / Mercury (Hg)	mg/kg	參考IEC 62321-4 (2013)，以感應耦合電漿原子發射光譜儀檢測. / With reference to IEC 62321-4 (2013) and performed by ICP-AES.	2	n.d.
六價鉻 / Hexavalent Chromium Cr(VI)	mg/kg	參考IEC 62321-7-2 (2017)，以UV-VIS檢測. / With reference to IEC 62321-7-2 (2017) and performed by UV-VIS.	8	n.d.
六溴環十二烷及所有主要被辨別出的異構物 / Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified (α- HBCDD, β- HBCDD, γ- HBCDD) (CAS No.: 25637-99-4 and 3194-55-6 (134237-51-7, 134237-50-6, 134237-52-8))	mg/kg	參考IEC 62321 (2008)，以氣相層析儀/質譜儀檢測. / With reference to IEC 62321 (2008). Analysis was performed by GC/MS.	5	n.d.

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測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測極限值 (MDL)	結果 (Result) No. 1
多溴聯苯總和 / Sum of PBBs	mg/kg	參考IEC 62321-6 (2015)，以氣相層析儀/質譜儀檢測. / With reference to IEC 62321-6 (2015) and performed by GC/MS.	-	n. d.
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	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.
多溴聯苯醚總和 / Sum of PBDEs	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.

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測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測極限值 (MDL)	結果 (Result) No. 1
鄰苯二甲酸丁苯甲酯 / BBP (Butyl Benzyl phthalate) (CAS No.: 85-68-7)	mg/kg	參考IEC 62321-8 (2017)，以氣相層析儀/質譜儀檢測. / With reference to IEC 62321-8 (2017). Analysis was performed by GC/MS.	50	n.d.
鄰苯二甲酸二丁酯 / DBP (Dibutyl phthalate) (CAS No.: 84-74-2)	mg/kg		50	n.d.
鄰苯二甲酸二 (2-乙基己基)酯 / DEHP (Di- (2-ethylhexyl) phthalate) (CAS No.: 117-81-7)	mg/kg		50	n.d.
鄰苯二甲酸二異丁酯 / DIBP (Di-isobutyl phthalate) (CAS No.: 84-69-5)	mg/kg		50	n.d.
鄰苯二甲酸二異癸酯 / DIDP (Di-isodecyl phthalate) (CAS No.: 26761-40-0; 68515-49-1)	mg/kg		50	n.d.
鄰苯二甲酸二異壬酯 / DINP (Di-isononyl phthalate) (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) (CAS No.: 117-84-0)	mg/kg		50	n.d.
鄰苯二甲酸二正己酯 / DNHP (Di-n-hexyl phthalate) (CAS No.: 84-75-3)	mg/kg		50	n.d.
鄰苯二甲酸二戊酯 / DNPP (Di-n-pentyl phthalate) (CAS No.: 131-18-0)	mg/kg		50	n.d.

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測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測極限值 (MDL)	結果 (Result) No. 1
鹵素 / Halogen				
鹵素 (氟) / Halogen-Fluorine (F) (CAS No.: 14762-94-8)	mg/kg	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.	50	n.d.
鹵素 (氯) / Halogen-Chlorine (Cl) (CAS No.: 22537-15-1)	mg/kg		50	n.d.
鹵素 (溴) / Halogen-Bromine (Br) (CAS No.: 10097-32-2)	mg/kg		50	n.d.
鹵素 (碘) / Halogen-Iodine (I) (CAS No.: 14362-44-8)	mg/kg		50	n.d.
全氟辛烷磺酸 / Perfluorooctane sulfonates (PFOS-Acid, Metal Salt, Amide)	mg/kg	參考US EPA 3550C (2007)，以液相層析儀/質譜儀檢測. / With reference to US EPA 3550C (2007). Analysis was performed by LC/MS.	10	n.d.
全氟辛酸 / PFOA (CAS No.: 335-67-1)	mg/kg		10	n.d.
聚氯乙烯 / PVC	**	以紅外光譜分析及焰色法檢測. / Analysis was performed by FTIR and FLAME Test.	-	Negative
銻 / Antimony (Sb)	mg/kg	參考US EPA 3052 (1996)，以感應耦合電漿原子發射光譜儀檢測. / With reference to US EPA 3052 (1996). Analysis was performed by ICP-AES.	2	n.d.
砷 / Arsenic (As)	mg/kg		2	n.d.
鈹 / Beryllium (Be)	mg/kg		2	n.d.

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備註(Note)：

1. mg/kg = ppm；0.1wt% = 1000ppm
2. n.d. = Not Detected (未檢出)
3. MDL = Method Detection Limit (方法偵測極限值)
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 samples was/were analyzed on behalf of the applicant as mixing sample in one testing. The above results was/were only given as the informality value.)

   PFOS濃度在物質或製備中不得超過0.001%(10ppm)，在半成品、成品或零部件中不得超過0.1%(1000ppm)，在紡織品或塗層材料中不得超過1μg/m²。

   (Outlawing PFOS as substances or preparations in concentrations above 0.001% (10ppm), in semi-finished products or articles or parts at a level above 0.1%(1000ppm), in textiles or other coated materials above 1μg/m².)
8. 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 samples was/were analyzed on behalf of the applicant as mixing sample in one testing. The above results was/were only given as the informality value.)

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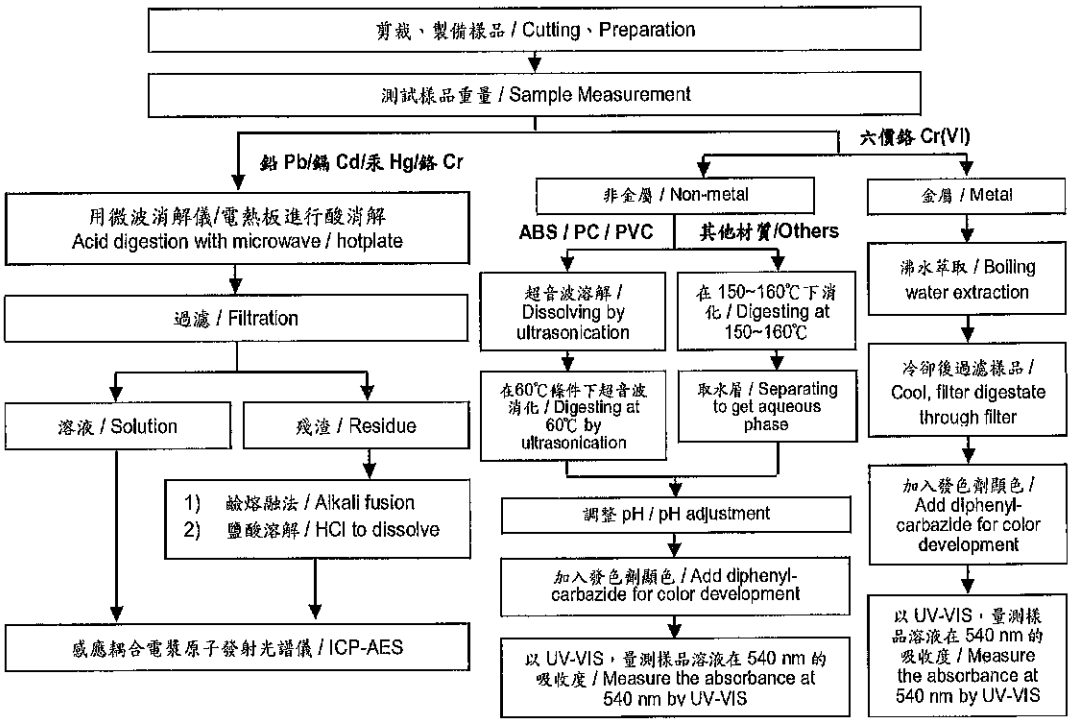
重金屬流程圖 / Analytical flow chart of Heavy Metal

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)

- 測試人員：陳恩臻 / Technician : Rita Chen
- 測試負責人：張啟興 / Supervisor: Troy Chang



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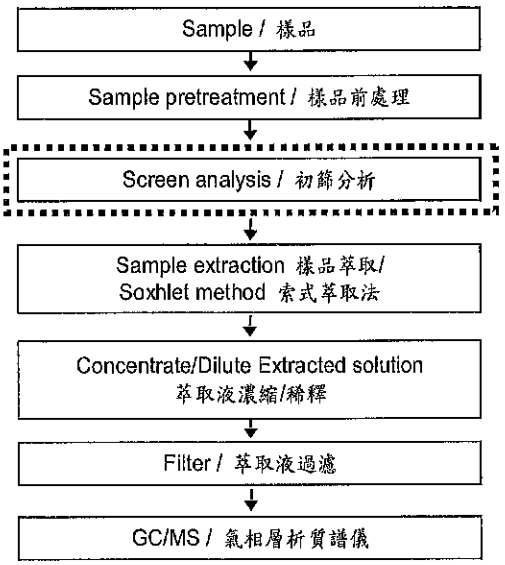
多溴聯苯/多溴聯苯醚分析流程圖 / Analytical flow chart - PBB/PBDE

- 測試人員：涂雅苓 / Technician: Yaling Tu
- 測試負責人：張啟興 / Supervisor: Troy Chang

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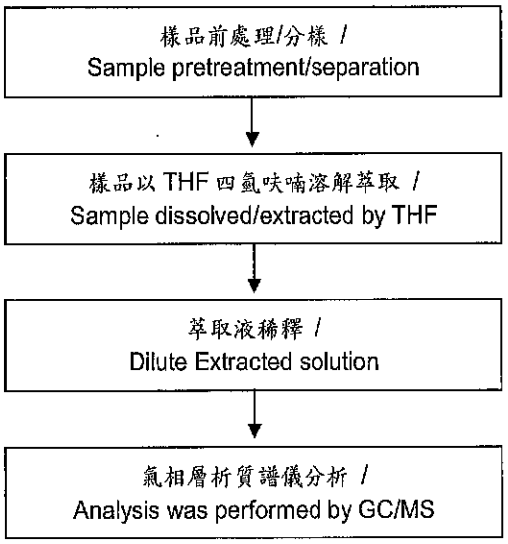
可塑劑分析流程圖 / Analytical flow chart - Phthalate

- 測試人員：涂雅苓 / Technician: Yaling Tu
- 測試負責人：張啟興 / Supervisor : Troy Chang

【測試方法/Test method: IEC 62321-8】



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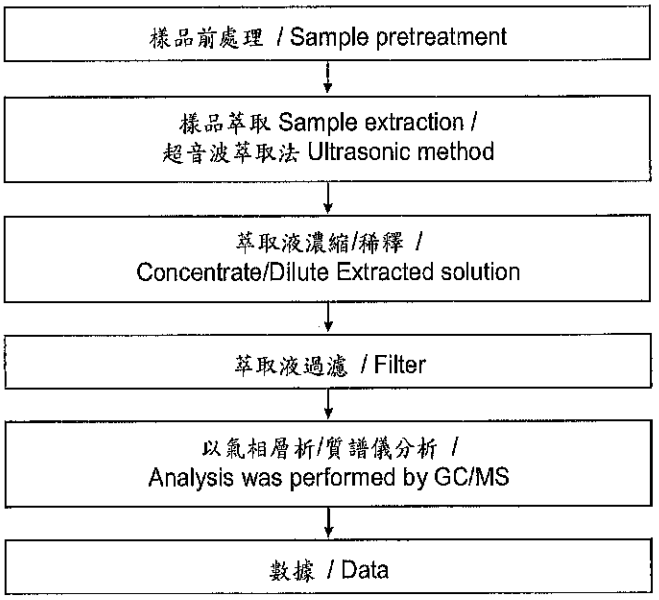
六溴環十二烷分析流程圖 / Analytical flow chart - HBCDD

- 測試人員：涂雅苓 / Technician: Yaling Tu
- 測試負責人：張啟興 / Supervisor: Troy Chang



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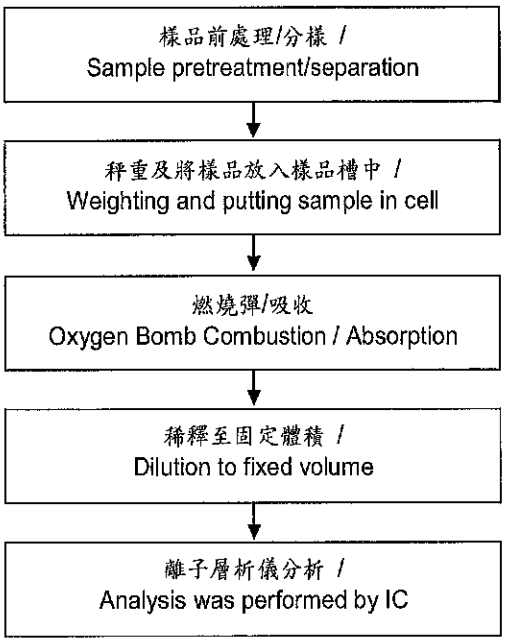
鹵素分析流程圖 / Analytical flow chart - Halogen

- 測試人員：陳恩臻 / Technician: Rita Chen
- 測試負責人：張啟興 / Supervisor: Troy Chang



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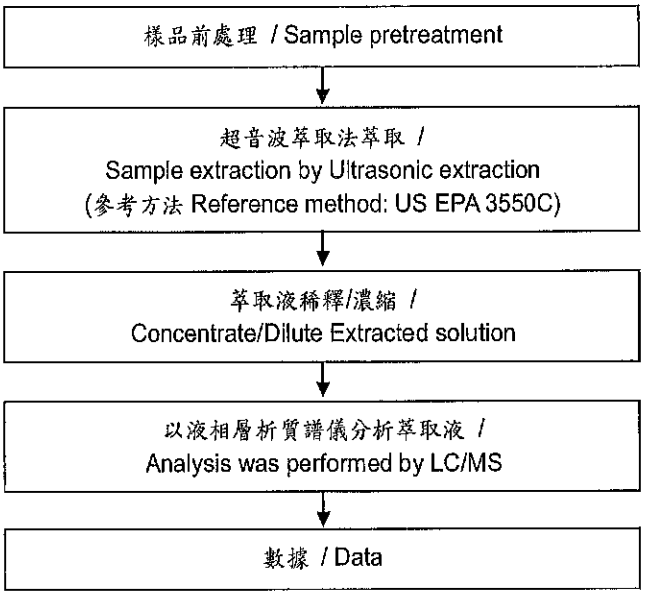
全氟辛酸/全氟辛烷磺酸分析流程圖 / Analytical flow chart - PFOA/PFOS

- 測試人員：涂雅苓 / Technician: Yaling Tu
- 測試負責人：張啟興 / Supervisor: Troy Chang



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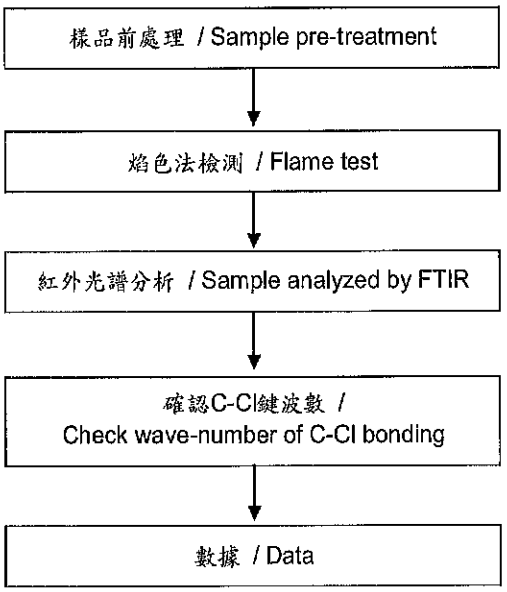
聚氯乙烯物質判定分析流程圖 / Analysis flow chart - PVC

- 測試人員：涂雅苓 / Technician: Yaling Tu
- 測試負責人：張啟興 / Supervisor: Troy Chang



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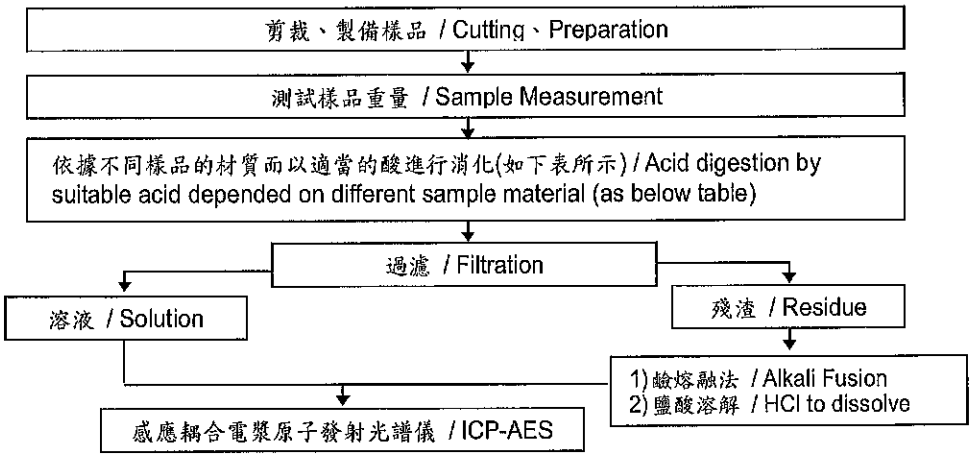
根據以下的流程圖之條件，樣品已完全溶解。 / These samples were dissolved totally by pre-conditioning method according to below flow chart.

- 測試人員：陳恩臻 / Technician: Rita Chen
- 測試負責人：張啟興 / Supervisor: Troy Chang

元素以 ICP-AES 分析的消化流程圖
(Flow Chart of digestion for the elements analysis performed by ICP-AES)



鋼,銅,鋁,焊錫 / Steel, copper, aluminum, solder	王水,硝酸,鹽酸,氫氟酸,雙氧水 / Aqua regia, HNO_3, HCl, HF, H_2O_2
玻璃 / Glass	硝酸,氫氟酸 / HNO_3/HF
金,鉑,鈀,陶瓷 / Gold, platinum, palladium, ceramic	王水 / Aqua regia
銀 / Silver	硝酸 / HNO_3
塑膠 / Plastic	硫酸,雙氧水,硝酸,鹽酸 / H_2SO_4, H_2O_2, HNO_3, HCl
其他 / Others	加入適當的試劑至完全溶解 / Added appropriate reagent to total digestion

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測試報告
Test Report

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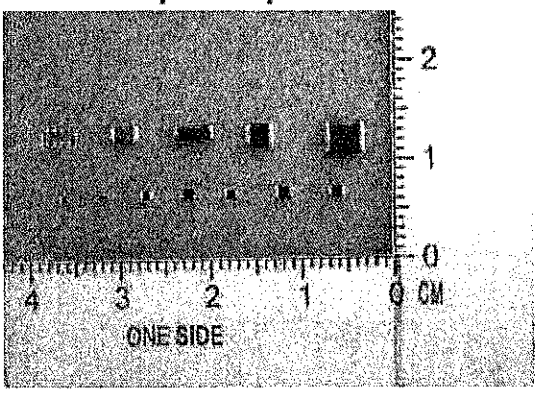
* 照片中如有箭頭標示，則表示為實際檢測之樣品/部位. *
(The tested sample / part is marked by an arrow if it's shown on the photo.)

CE/2018/C0389



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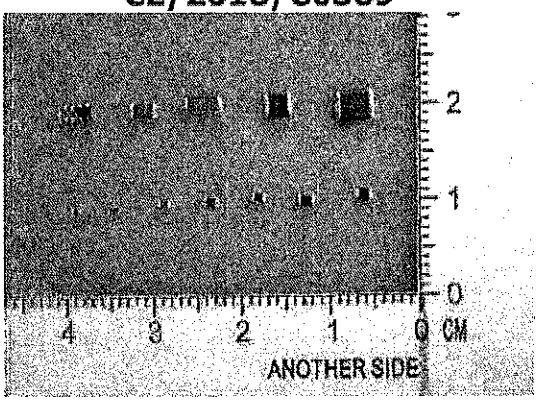

** 報告結尾 (End of Report) **

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