

供应商名称: 诚易电子有限公司

产 品 承 认 书



Specification for Approval

客户名称

Client Name: 百富计算机技术(深圳)有限公司

品 牌

Brand Name: INPAQ

原厂料号

Part No: ACA-5036-A2-CC-S

物料规格&描述

Part Description: 2.4GHz-Chip天线-ACA-5036-A2-CC-S-INPAQ

产品制造商(全称)

Manufacturer: 禾邦电子(苏州)有限公司

生产企业:

Name of factory: _____

百富物料类别

PAX Part Name: 天线

百富物料编号


PAX Materiel No.: 200212000000052

百富物料描述

PAX Description: 2.4GHz-Chip 天线-ACA- 5036-A2-CC-S-INPAQ

百富采用原因

PAX Import Reason: _____

供 应 商 签 章	客 户 签 章
 刘晓	承 认: <u>蔡文伟 2018.1.3</u> 确 认: <u>董江林</u>

供应商联系地址: 香港中环德辅道中 88 号中环 21 楼 C 室

供应商联系人: 刘晓

联系电话及传真: 13502843315

ACA-5036-A2-CC-S Specification

1. APPLICATION:

WLAN, 802.11b/g, Bluetooth, etc...

2. Explanation of part number :

$\frac{AC}{(1)} \quad \frac{A}{(2)} \quad - \quad \frac{5036}{(3)} \quad - \quad \frac{A2}{(4)} \quad - \quad \frac{CC}{(5)} \quad - \quad \frac{S}{(6)} \quad \bar{(7)}$

- (1) Product Type : Chip Antenna
- (2) Center Frequency/Band Code : A--2.45GHz group
- (3) Size Code: 5.0mm(Length) x 3.6mm(Width)
- (4) Design Revision Code: Rev.2
- (5) CC= Coupling Ceramics Type
- (6) Special Code: S=RoHS Compliant
- (7) Suffix For Special Requirements

3. Electrical Specification :

ITEM		SPECIFICATION
Frequency Band		2.40GHz~2.50GHz
VSWR		Less than 2.5
Polarization		Linear
*Peak Gain	Layout A	3 dBi Typ.
	Layout B	2.1 dBi Typ.
*Peak Efficiency	Layout A	80% Typ.
	Layout B	74% Typ
Impedance		50Ω Typ.

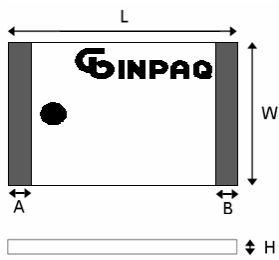
* Test condition: Test board size 80*40 mm

Matching circuit: Pi matching circuit will be required

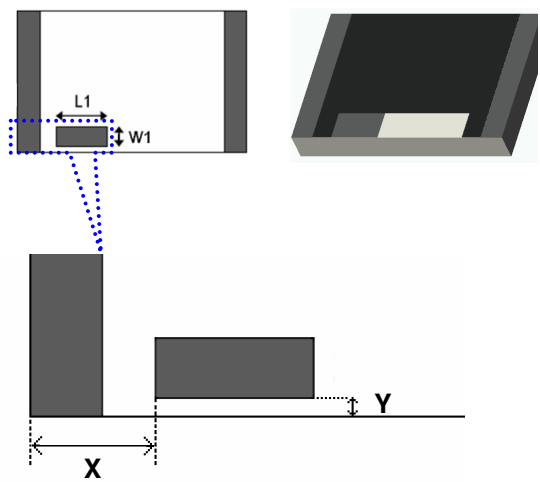
UNLESS OTHER SPECIFIED TOLERANCES ON :			INPAQ TECHNOLOGY CO., LTD.
X=±	X.X=±		
ANGLES=±		HOLEDIA=±	
SCALE : -----	UNIT : mm		
DRAWN BY : 吳為盛 <i>wid</i>	CHECKED BY : 楊奇峯 <i>Kenny</i>		
DESIGNED BY : 謝立庭 <i>LT</i>	APPROVED BY : 蘇志銘 <i>J-2</i>		
TITLE : ACA-5036-A2-CC-S Specification		DOCUMENT NO.	ENS000023010
			SPEC REV. A6

4. Physical Dimension : (Unit:mm)

TOP view



Bottom view



Chip Antenna	L	W	A	B	L1	W1	H	X	Y
ACA5036	5.2±0.3	3.7±0.3	0.45±0.25	0.45±0.25	1.1±0.20	0.55±0.20	0.70±0.15	0.85±0.25	0.12±0.06

UNLESS OTHER SPECIFIED TOLERANCES ON :

X=± X.X=± X.XX= ANGLAS=± HOLEDIA=±



INPAQ TECHNOLOGY CO., LTD.

SCALE : -----

UNIT : mm

DRAWN BY : 吳為盛 *wid*

CHECKED BY : 楊奇峯 *kenng*

DESIGNED BY : 謝立庭 *LT*

APPROVED BY : 蘇志銘 *J-2*

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TITLE : ACA-5036-A2-CC-S Specification

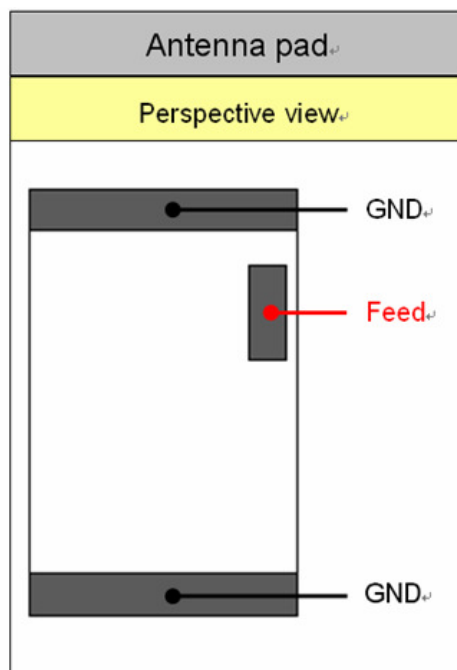
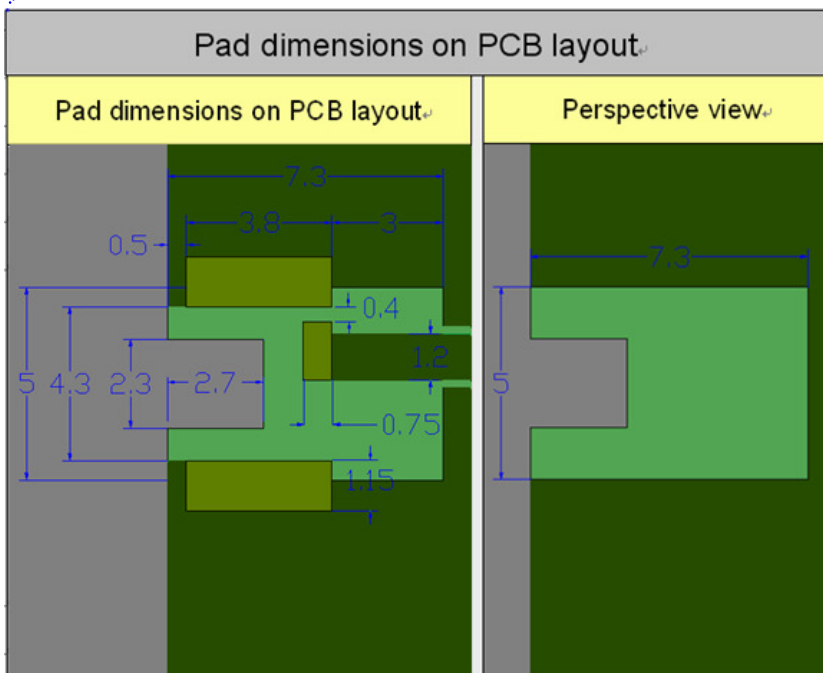
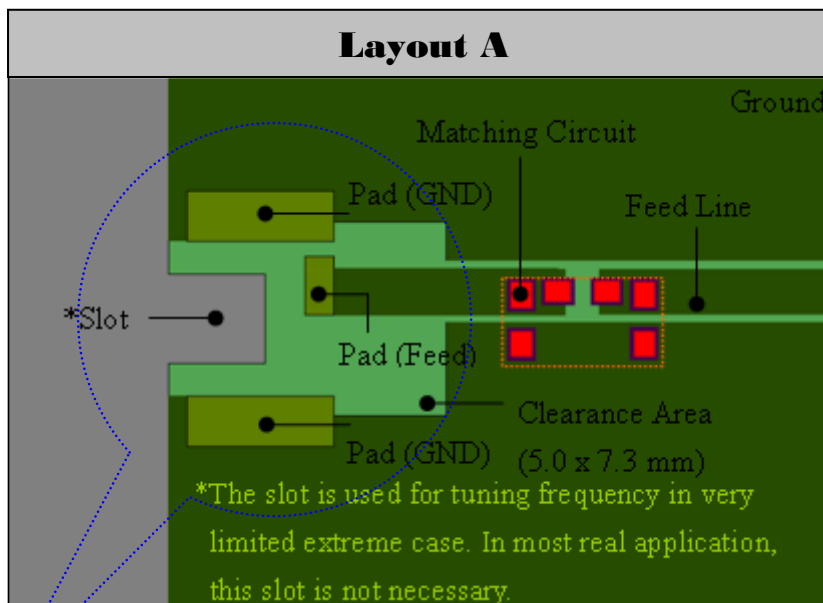
DOCUMENT NO.

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5. Recommend PCB Layout : (Unit:mm)



PCB pad dimensions

Terminal name	Terminal Dimensions
Pad (Feed)	1.65 X 0.75
Pad (GND)	3.8 X 1.15
Pad (GND)	3.8 X 1.15

Antenna pad dimensions

Terminal name	Terminal Dimensions
Feed	1.1 X 0.55
GND	3.7 X 0.45
GND	3.7 X 0.45

UNLESS OTHER SPECIFIED TOLERANCES ON :

X=± X.X=± X.XX=

ANGLES=± HOLEDIA=±



INPAQ TECHNOLOGY CO., LTD.

SCALE : -----

UNIT : mm

DRAWN BY : 吳為盛 wsd

CHECKED BY : 楊奇峯 Kenny

DESIGNED BY : 謝立庭 LT

APPROVED BY : 蘇志銘 J-2

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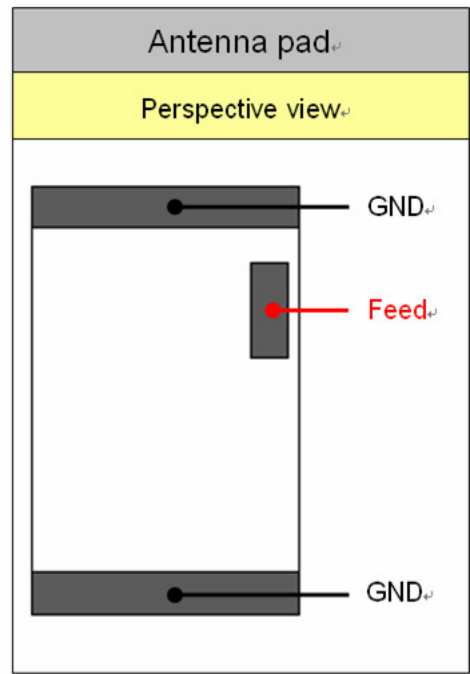
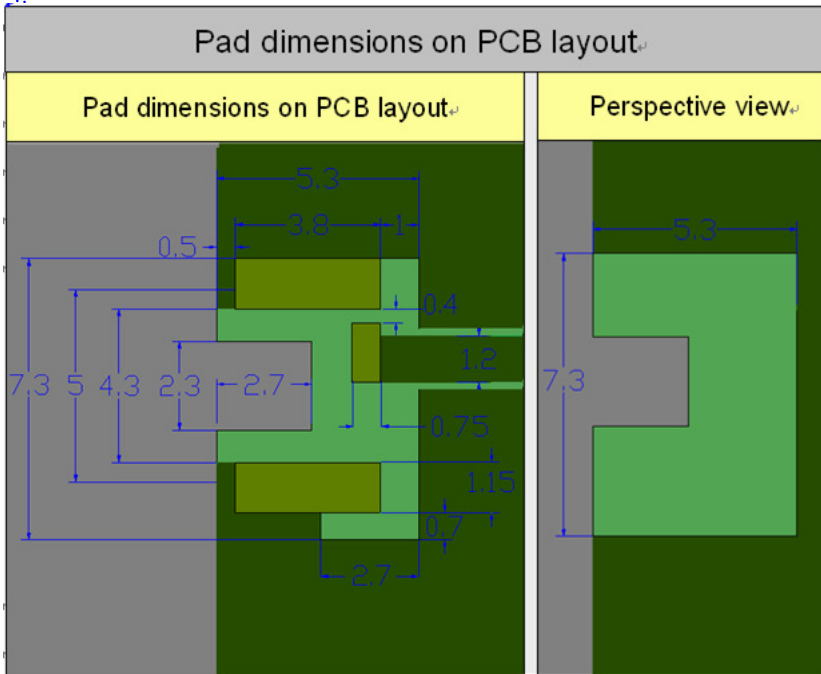
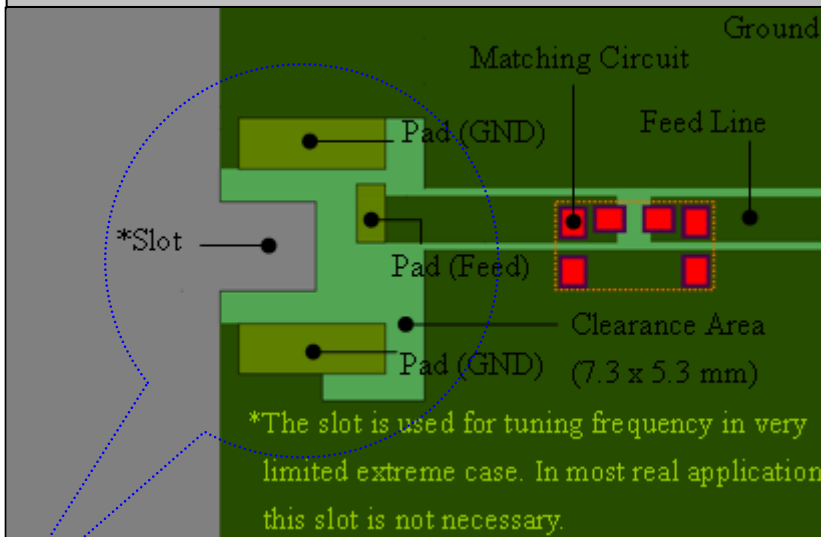
TITLE : ACA-5036-A2-CC-S Specification

DOCUMENT NO.

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Layout B



PCB pad dimensions

Terminal name	Terminal Dimensions
Pad (Feed)	1.65 X 0.75
Pad (GND)	3.8 X 1.15
Pad (GND)	3.8 X 1.15

Antenna pad dimensions

Terminal name	Terminal Dimensions
Feed	1.1 X 0.55
GND	3.7 X 0.45
GND	3.7 X 0.45

UNLESS OTHER SPECIFIED TOLERANCES ON :

X=± X.X=± X.XX=±
 ANGLES=± HOLEDIA=±



INPAQ TECHNOLOGY CO., LTD.

SCALE : -----

UNIT : mm

DRAWN BY : 吳為盛 *wdd*

CHECKED BY : 楊奇峯 *kenng*

DESIGNED BY : 謝立庭 *LT*

APPROVED BY : 蘇志銘 *J-2*

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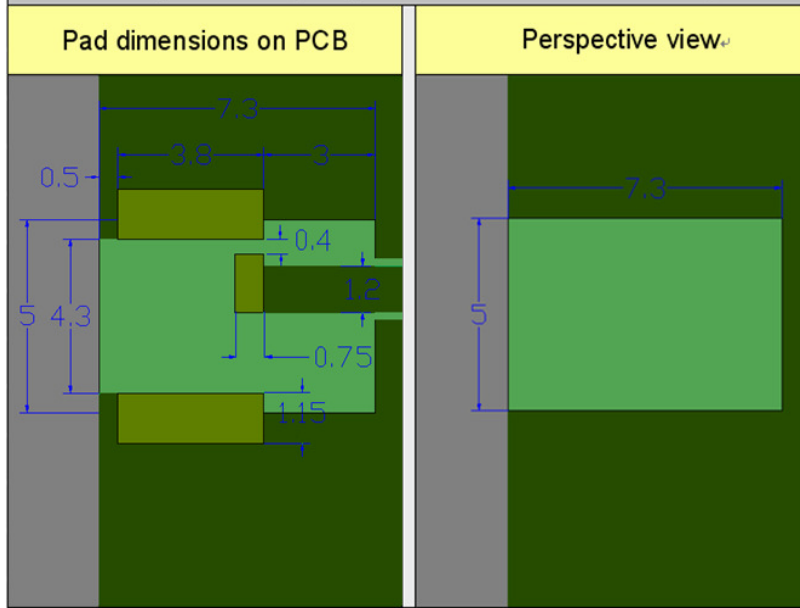
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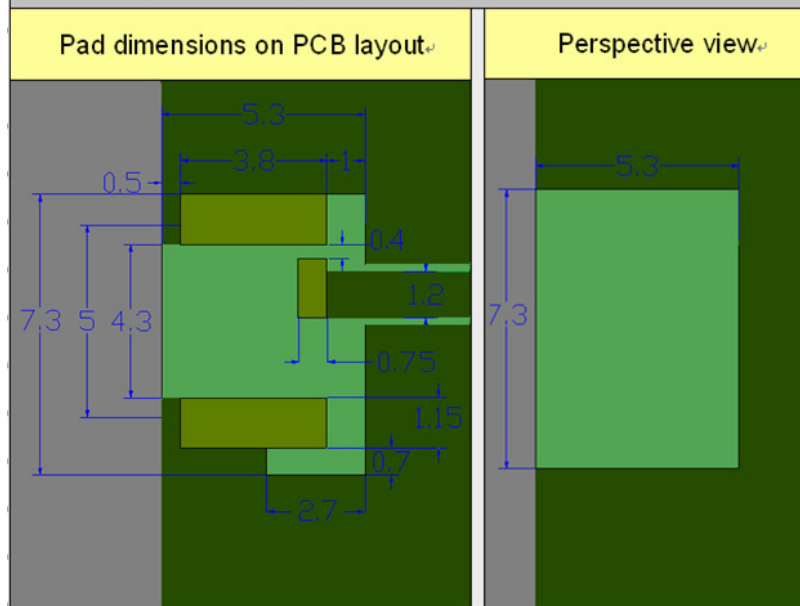
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Layout C (Layout A without slot)



Layout D (Layout B without slot)



UNLESS OTHER SPECIFIED TOLERANCES ON :

X=± X.X=± X.XX=±
 ANGLES=± HOLEDIA=±



INPAQ TECHNOLOGY CO., LTD.

SCALE : -----

UNIT : mm

DRAWN BY : 吳為盛 *wid*

CHECKED BY : 楊奇峯 *Kenny*

DESIGNED BY : 謝立庭 *LT*

APPROVED BY : 蘇志銘 *Jerry*

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TITLE : ACA-5036-A2-CC-S Specification

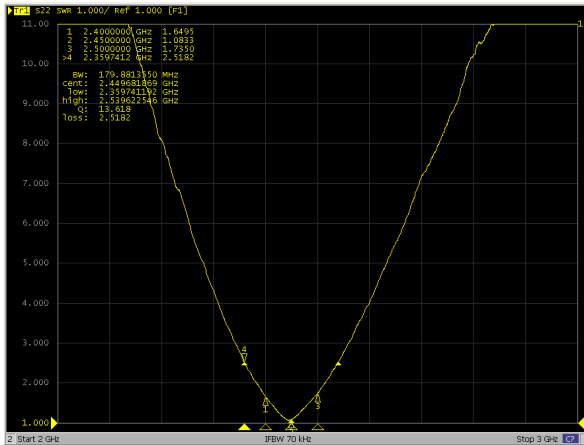
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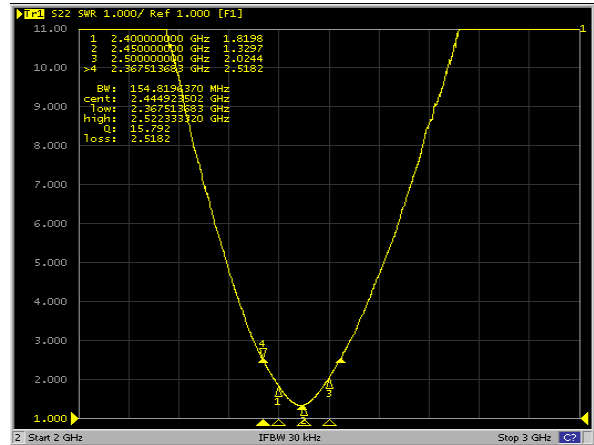
6. Electrical Characteristics :

Layout A : VSWR



Mark	Frequency	VSWR
1	2400 MHz	1.65
2	2450 MHz	1.08
3	2500 MHz	1.73

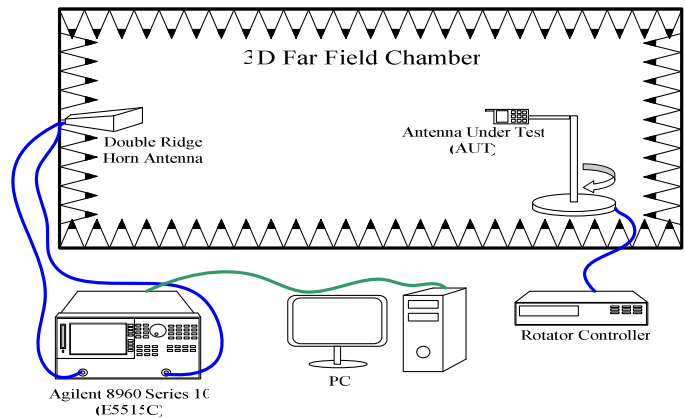
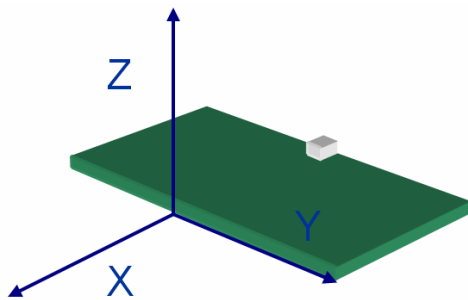
Layout B : VSWR



Mark	Frequency	VSWR
1	2400 MHz	1.82
2	2450 MHz	1.33
3	2500 MHz	2.02

Radiation Pattern

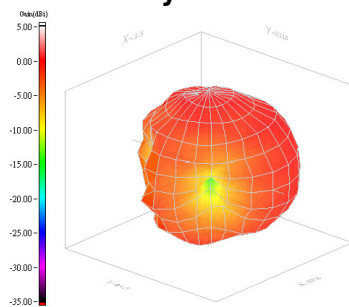
The Gain pattern is measured in INPAQ's FAR-field chamber. DUT is placed on the table of rotator, a standard horn antenna and Vector Network Analyzer is used to collect data.



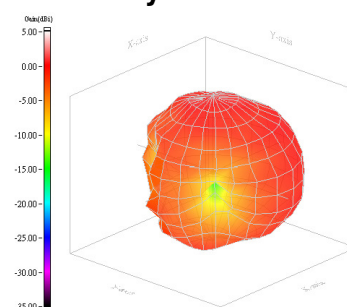
3D Chamber Definition

© 3D Gain Pattern (2450 MHz)

Layout A :



Layout B :



UNLESS OTHER SPECIFIED TOLERANCES ON :

X=± X.X=± X.XX= ANGLAS=± HOLEDIA=±

SCALE : ----- UNIT : mm

DRAWN BY : 吳為盛 *wdd* CHECKED BY : 楊奇峯 *Kenny*

DESIGNED BY : 謝立庭 *LT* APPROVED BY : 蘇志銘 *Jerry*

TITLE : ACA-5036-A2-CC-S Specification



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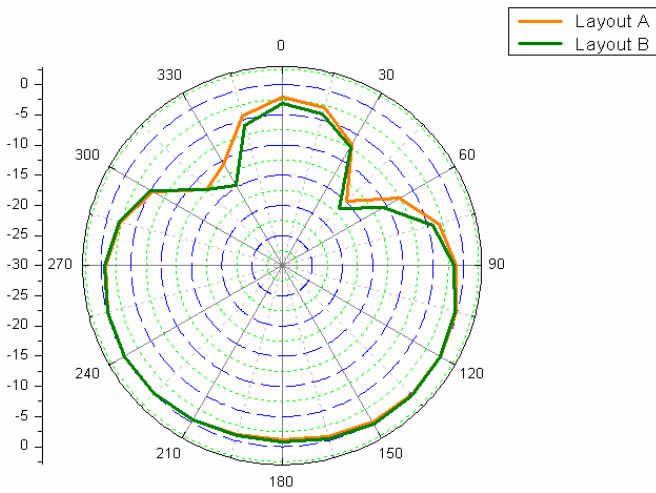
DOCUMENT NO.

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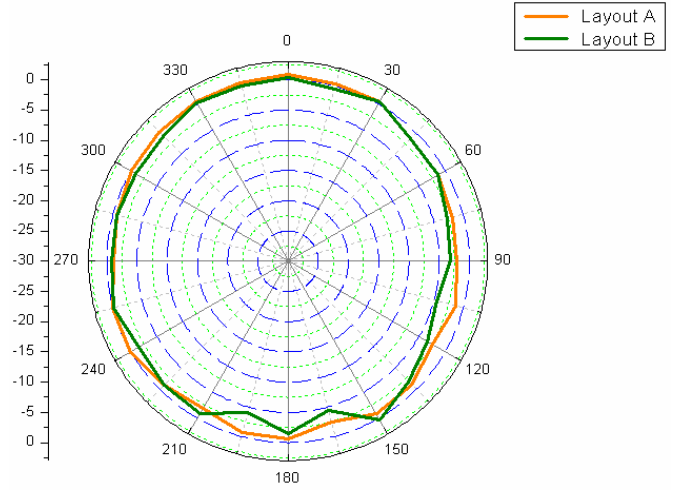
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© 2D Gain Pattern (2450 MHz)

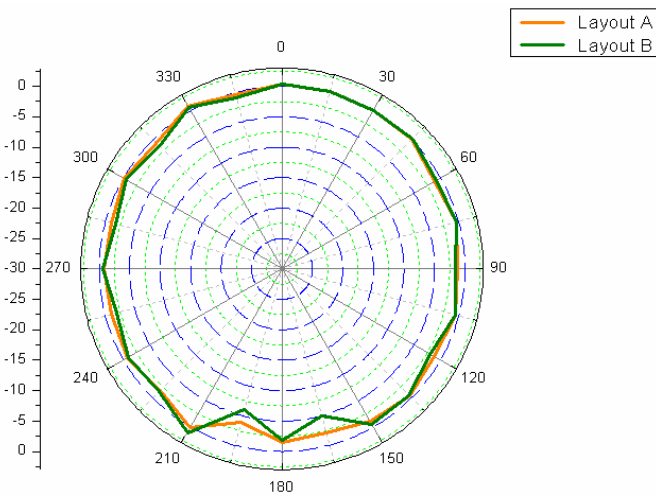
X-Y Plane



X-Z Plane



Y-Z Plane



UNLESS OTHER SPECIFIED TOLERANCES ON :

X=± X.X=± X.XX= ANGLES=± HOLEDIA=±



INPAQ TECHNOLOGY CO., LTD.

SCALE : -----

UNIT : mm

DRAWN BY : 吳為盛 *wid*

CHECKED BY : 楊奇峯 *Kenny*

DESIGNED BY : 謝立庭 *LT*

APPROVED BY : 蘇志銘 *J-2*

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DOCUMENT NO.

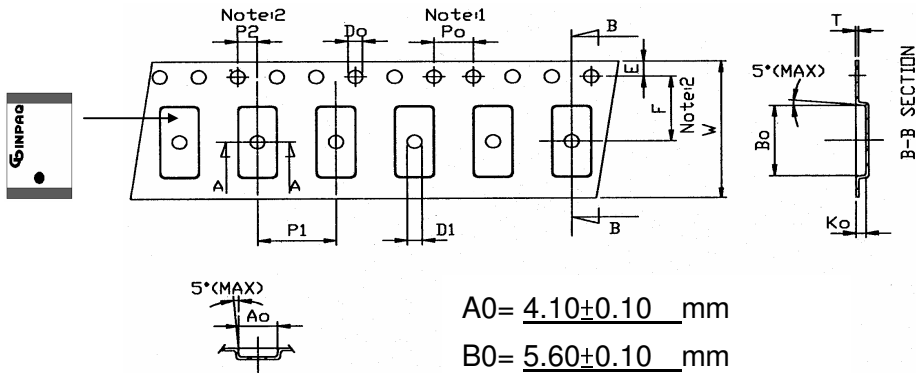
ENS000023010

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7. Taping Package and Label Marking: (unit: mm)

(1) Quantity/Reel: 2000pcs/Reel

(2) Carrier tape dimensions



Symbol	Spec.
Po	4.00±0.1
P1	8.00±0.1
P2	2.00±0.05
Do	1.55±0.05
D1	1.50(MIN)
E	1.75±0.1
F	5.50±0.05
10Po	40.00±0.2
W	12.00±0.1
T	0.25±0.05

$$A0 = 4.10 \pm 0.10 \text{ mm}$$

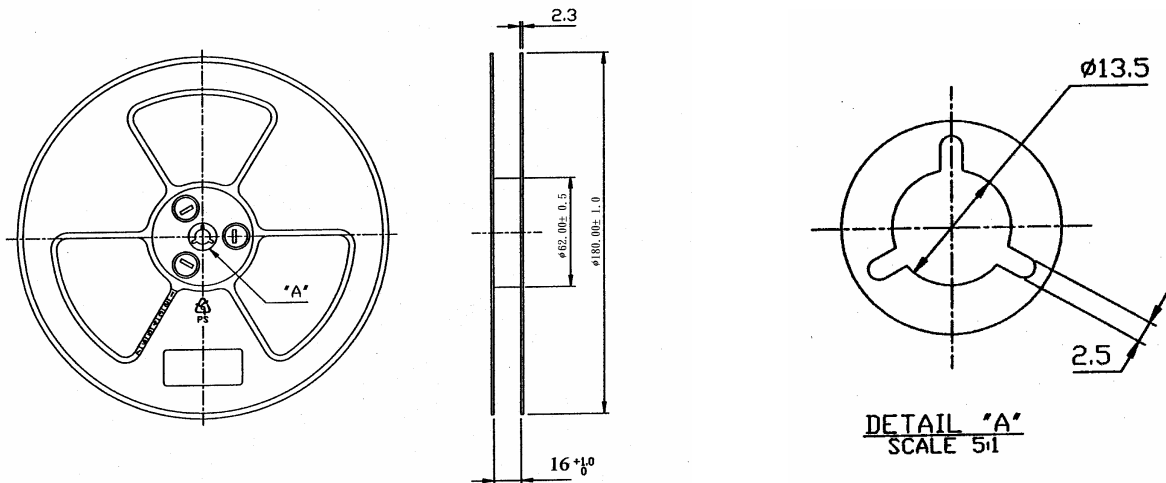
$$B0 = 5.60 \pm 0.10 \text{ mm}$$

$$K0 = 1.02 \pm 0.10 \text{ mm}$$

Notice:

- 10 Sprocket hole pitch cumulative tolerance is $\pm 0.1\text{mm}$
- Pocket position relative to sprocket hole measured as true position of pocket not pocket hole.
- Ao & Bo measured on a plane 0.3mm above the bottom of the pocket to top surface of the carrier.
- Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
- Carrier camber shall be not than 1mm per 100mm through a length of 250mm.

(3) Taping reel dimensions



UNLESS OTHER SPECIFIED TOLERANCES ON :

X=± X.X=± X.XX= HOLEDIA=±
 ANGLES=±



INPAQ TECHNOLOGY CO., LTD.

SCALE : ----- UNIT : mm

DRAWN BY : 吳為盛 *wdd* CHECKED BY : 楊奇峯 *kenng*

DESIGNED BY : 謝立庭 *LT* APPROVED BY : 蘇志銘 *J-T*

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TITLE : ACA-5036-A2-CC-S Specification

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8. Environmental Characteristics

(1) Reliability Test

Item	Condition	Specification
Thermal shock	1. 30±3 minutes at -40°C±5°C, 2. Convert to +105°C (5 minutes) 3. 30±3 minutes at +105°C±5°C, 4. Convert to -40°C (5 minutes) 5. Total 100 continuous cycles	No apparent damage Fulfill the electrical spec. after test.
Humidity resistance	1. Humidity: 85% R.H. 2. Temperature: 85±5°C 3. Time: 1000 hours.	No apparent damage Fulfill the electrical spec. after test.
High temperature resistance	1. Temperature: 150°C±5°C 2. Time: 1000 hours.	No apparent damage Fulfill the electrical spec. after test.
Low temperature resistance	1. Temperature: -40°C±5°C 2. Time: 1000 hours.	No apparent damage Fulfill the electrical spec. after test.
Soldering heat resistance	1. Solder bath temperature : 260±5°C 2. Bathing time: 10±1 seconds	No apparent damage
Solderability	The dipped surface of the terminal shall be at least 95% covered with solder after dipped in solder bath of 245±5°C for 3±1 seconds.	No apparent damage

(2) Storage condition

(a) At warehouse:

The temperature should be within 0 ~ 30°C and humidity should be less than 60% RH.

The product should be used within 1 year from the time of delivery.

(b) On board:

The temperature should be within -40~85°C and humidity should be less than 85% RH.

(3) Operating temperature range

Operating temperature range : -40°C to +105°C.

UNLESS OTHER SPECIFIED TOLERANCES ON :

X=± X.X=± X.XX=
ANGLES=± HOLEDIA=±



INPAQ TECHNOLOGY CO., LTD.

SCALE : ----- UNIT : mm

DRAWN BY : 吳為盛 *wid* CHECKED BY : 楊奇峯 *Kenny*

DESIGNED BY : 謝立庭 *LT* APPROVED BY : 蘇志銘 *J-2*

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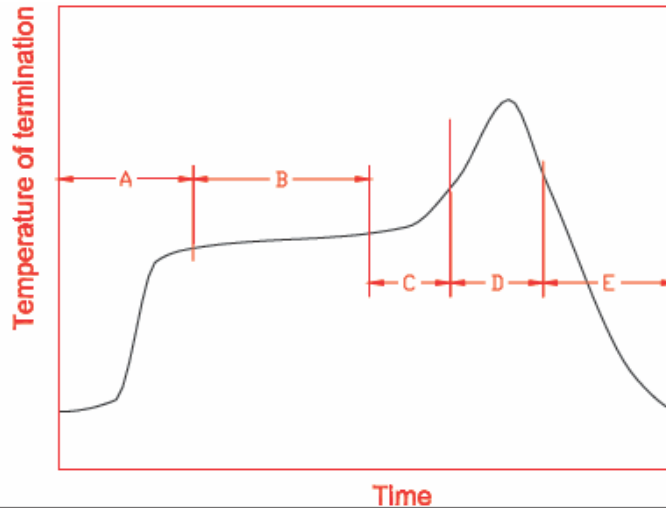
TITLE : ACA-5036-A2-CC-S Specification

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9. Recommended reflow soldering



A	1 st rising temperature	The normal to Preheating temperature	30s to 60s
B	Preheating	140°C to 160°C	60s to 120s
C	2 nd rising temperature	Preheating to 200°C	20s to 40s
D	Main heating	if 220°C	50s~60s
		if 230°C	40s~50s
		if 240°C	30s~40s
		if 250°C	20s~40s
E	Regular cooling	200°C to 100°C	1°C/s ~ 4°C/s

*reference: J-STD-020C

(1) Soldering gun procedure

Note the follows, in case of using solder gun for replacement.

- (a) The tip temperature must be less than 350°C for the period within 3 seconds by using soldering gun under 30 W.
- (b) The soldering gun tip shall not touch this product directly.

(2) Soldering volume

Note that excess of soldering volume will easily get crack the body of this product.

UNLESS OTHER SPECIFIED TOLERANCES ON :

X=± X.X=± X.XX=±
 ANGLES=± HOLEDIA=±



INPAQ TECHNOLOGY CO., LTD.

SCALE : -----

UNIT : mm

DRAWN BY : 吳為盛 *wdd*

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DOCUMENT NO.

ENS000023010

SPEC REV.

A6

Test Report 測試報告

Applicant 申請廠商: Inpaq Technology Co.,Ltd.
No. 11, Ke-Yi St.,
Chunan, Miaoli, Taiwan, R.O.C.

Number : TWNC00618628S1
報告號碼

Date 日期 : Jul 27, 2017

This is to supersede
Report No. TWNC00618628
Dated Jul 12, 2017

此份報告取代報告號碼 TWNC00618628
日期 2017 年 7 月 12 日

Sample Description 樣品敘述:

One (1) group of submitted samples said to be :

以下測試樣品乃供應商所提供及確認 :

Sample Description : ACA 5036 Series, ACD 5036 Series, ACK 5036 Series, ACL 5036 Series,
樣品名稱 ACM3 5036 Series, ACM4 5036 Series

Date Sample Received : Jul 05, 2017

收件日期

Date Test Started : Jul 05, 2017

開始測試日期

Test Conducted 測試執行:

As requested by the applicant, for details please refer to attached pages.

依申請商之要求, 細節請參考附頁.

Authorized by:
On Behalf of Intertek Testing Services
Taiwan Limited



Matt Wang
Sr. Manager



Test Conducted 測試內容 :

Test Result Summary 測試結果 :

Test Item 測試項目	Unit 單位	Test Method 測試方法	Result 結果	RL
			Black/off-white electronic component (mixed all parts)	
Heavy Metal 重金屬				
Cadmium (Cd) Content 鎘含量	ppm	With reference to IEC 62321-5: 2013, by microwave or acid digestion and determined by ICP-OES. 參考 IEC 62321-5: 2013，以微波或酸液消化法消化樣品並用感應耦合電漿原子發射光譜儀分析。	ND	2
Lead (Pb) Content 鉛含量	ppm	With reference to IEC 62321-5: 2013, by microwave or acid digestion and determined by ICP-OES. 參考 IEC 62321-5: 2013，以微波或酸液消化法消化樣品並用感應耦合電漿原子發射光譜儀分析。	ND	2
Mercury (Hg) Content 汞含量	ppm	With reference to IEC 62321-4: 2013, by microwave or acid digestion and determined by ICP-OES. 參考 IEC 62321-4: 2013，以微波或酸液消化法消化樣品並用感應耦合電漿原子發射光譜儀分析。	ND	2
Chromium VI (Cr ⁶⁺) Content 六價鉻含量	ppm	With reference to IEC 62321-7-2: 2017, organic solvent was used to dissolve or swell sample matrix, followed by alkaline digestion and determined by UV-Vis Spectrophotometer. 參考 IEC 62321-7-2:2017，以有機溶劑溶解或使樣品基質膨脹，再進行鹼液消化，用紫外光-可見光分光光度計分析。	ND	8



Test Conducted 測試內容 :

Test Item 測試項目	Unit 單位	Test Method 測試方法	Result 結果	
			Black/off-white electronic component (mixed all parts)	RL
Polybrominated Biphenyls (PBBs) 多溴聯苯				
Monobrominated Biphenyls (MonoBB) 單溴聯苯	ppm	With reference to IEC 62321-6: 2015, by solvent extraction and determined by GC-MS and further HPLC-DAD confirmation when necessary. 參考 IEC 62321-6: 2015, 以溶劑萃取並用氣相層析質譜儀分析, 必要時會以高效液相層析儀光二極體陣列偵測儀進行確認。	ND	5
Dibrominated Biphenyls (DiBB) 二溴聯苯	ppm		ND	5
Tribrominated Biphenyls (TriBB) 三溴聯苯	ppm		ND	5
Tetrabrominated Biphenyls (TetraBB) 四溴聯苯	ppm		ND	5
Pentabrominated Biphenyls (PentaBB) 五溴聯苯	ppm		ND	5
Hexabrominated Biphenyls (HexaBB) 六溴聯苯	ppm		ND	5
Heptabrominated Biphenyls (HeptaBB) 七溴聯苯	ppm		ND	5
Octabrominated Biphenyls (OctaBB) 八溴聯苯	ppm		ND	5
Nonabrominated Biphenyls (NonaBB) 九溴聯苯	ppm		ND	5
Decabrominated Biphenyl (DecaBB) 十溴聯苯	ppm		ND	5
Polybrominated Diphenyl Ethers (PBDEs) 多溴聯苯醚				
Monobrominated Diphenyl Ethers (MonoBDE) 單溴聯苯醚	ppm	With reference to IEC 62321-6: 2015, by solvent extraction and determined by GC-MS and further HPLC-DAD confirmation when necessary. 參考 IEC 62321-6: 2015, 以溶劑萃取並用氣相層析質譜儀分析, 必要時會以高效液相層析儀光二極體陣列偵測儀進行確認。	ND	5
Dibrominated Diphenyl Ethers (DiBDE) 二溴聯苯醚	ppm		ND	5
Tribrominated Diphenyl Ethers (TriBDE) 三溴聯苯醚	ppm		ND	5
Tetrabrominated Diphenyl Ethers (TetraBDE) 四溴聯苯醚	ppm		ND	5
Pentabrominated Diphenyl Ethers (PentaBDE) 五溴聯苯醚	ppm		ND	5
Hexabrominated Diphenyl Ethers (HexaBDE) 六溴聯苯醚	ppm		ND	5
Heptabrominated Diphenyl Ethers (HeptaBDE) 七溴聯苯醚	ppm		ND	5
Octabrominated Diphenyl Ethers (OctaBDE) 八溴聯苯醚	ppm		ND	5
Nonabrominated Diphenyl Ethers (NonaBDE) 九溴聯苯醚	ppm		ND	5
Decabrominated Diphenyl Ether (DecaBDE) 十溴聯苯醚	ppm		ND	5



Test Conducted 測試內容 :

Test Item 測試項目	Unit 單位	Test Method 測試方法	Result 結果	
			Black/off-white electronic component (mixed all parts)	RL
Phthalates 鄰苯二甲酸酯				
Di(2-ethylhexyl) Phthalate (DEHP) 鄰苯二甲酸二(2-乙基己基)酯	ppm	With reference to IEC 62321-8:2017, by solvent extraction and determined by GC-MS. 參考 IEC 62321-8:2017, 以溶劑萃取並用氣相層析質譜儀分析。	ND	50
Dibutyl Phthalate (DBP) 鄰苯二甲酸二丁酯	ppm		ND	50
Benzyl Butyl Phthalate (BBP) 鄰苯二甲酸苯基丁酯	ppm		ND	50
Di-(Iso-Nonyl) Phthalate (DINP) 鄰苯二甲酸二異壬酯	ppm		ND	50
Diisobutyl Phthalate (DIBP) 鄰苯二甲酸二異丁酯	ppm		ND	50
Halogen Content 鹵素含量				
Fluorine (F) 氟	ppm	With reference to EN 14582:2016 by combustion bomb with oxygen and determined by Ion Chromatography. 參考 EN 14582:2016, 以氧彈燃燒集氣法並用離子層析儀分析。	ND	50
Chlorine (Cl) 氯	ppm		ND	50
Bromine (Br) 溴	ppm		ND	50
Iodine (I) 碘	ppm		ND	50
Others 其他				
Hexabromo cyclododecane (HBCDD) 六溴環十二烷	ppm	With reference to USEPA 3540C, by solvent extraction and determined by GC-MS. 參考 USEPA 3540C, 以溶劑萃取並用氣相層析質譜儀分析。	ND	10

Remarks: ppm = Parts per million based on weight of tested sample = mg/kg
備註 百萬分之一, 依據測試樣品重量計算 = 毫克/公斤
ND = Not detected 未檢測出
RL = Reporting limit, quantitation limit of analyte in sample
報告極限, 測試樣品之定量偵測極限

Responsibility of Chemist 分析人員 : Pely Hsiao/ Vita Fu

Date Sample Received 樣品收件日期 : Jul 05, 2017
Test Period 樣品測試期間 : Jul 05, 2017 to Jul 12, 2017



Test Conducted 測試內容 :

RoHS Limit RoHS 限值

Restricted Substances 限用物質	Limits 限值
Cadmium (Cd) content 鎘含量	0.01% (100ppm)
Lead (Pb) content 鉛含量	0.1% (1000ppm)
Mercury (Hg) content 汞含量	0.1% (1000ppm)
Chromium VI (Cr ⁶⁺) content 六價鉻含量	0.1% (1000ppm)
Polybrominated Biphenyls (PBBs) 多溴聯苯	0.1% (1000ppm)
Polybrominated Diphenyl Ethers (PBDEs) 多溴聯苯醚	0.1% (1000ppm)
Di(2-ethylhexyl) Phthalate (DEHP) 鄰苯二甲酸二(2-乙基己基)酯	0.1% (1000ppm)
Dibutyl Phthalate (DBP) 鄰苯二甲酸二丁酯	0.1% (1000ppm)
Benzyl Butyl Phthalate (BBP) 鄰苯二甲酸苯基丁酯	0.1% (1000ppm)
Diisobutyl Phthalate (DIBP) 鄰苯二甲酸二異丁酯	0.1% (1000ppm)

The limits were quoted from Annex II of 2011/65/EU and Amendment (EU) 2015/863 for homogeneous material.
本限值是依據歐盟指令 2011/65/EU 及其更新指令(EU) 2015/863 之附錄二針對均質材質所訂定。



Test Conducted 測試內容 :

Measurement Flowchart 測試流程圖:

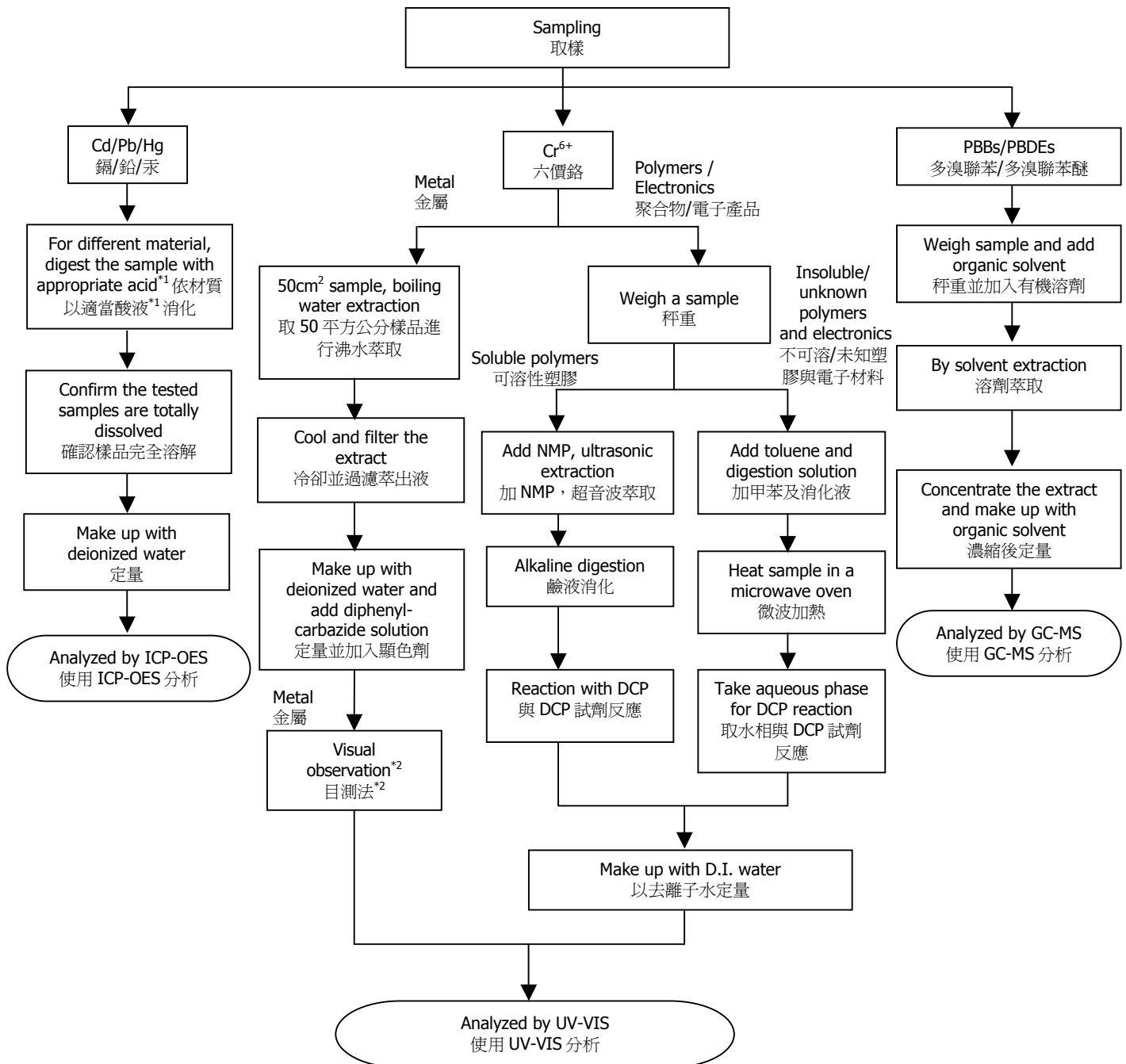
Test for Cd/Pb/Hg/Chromium (VI)/PBBs/PBDEs Content RoHS 六項測試

Reference Method 參考方法: Cd/Pb: IEC 62321-5:2013; Hg: IEC 62321-4:2013;

Chromium (VI): IEC 62321-7-1:2015 (boiling water extraction);

Chromium (VI): IEC 62321-7-2:2017 (solvent and alkaline extraction);

PBBs/PBDEs: IEC 62321-6:2015



Test Conducted 測試內容 :

Remarks 備註:

*1: List of Appropriate Acid 各材質添加酸液如下表 :

Material 材質	Acid Added for Digestion 添加酸液種類
Polymers 聚合物	HNO ₃ ,HCl,HF,H ₂ O ₂ ,H ₃ BO ₃ 硝酸、鹽酸、氫氟酸、雙氧水、硼酸
Metals 金屬	HNO ₃ ,HCl,HF 硝酸、鹽酸、氫氟酸
Electronics 電子產品	HNO ₃ ,HCl,H ₂ O ₂ ,HBF ₄ 硝酸、鹽酸、雙氧水、氟硼酸

*2: If sample solution is significantly more intense than 0.13 µg/cm² equivalent comparison standard, Chromium VI would be determined as detected, the result of visual observation is positive.

當待測樣品溶液顏色明顯比 0.13 µg/cm² 深，採用目測法判定六價鉻結果為陽性。

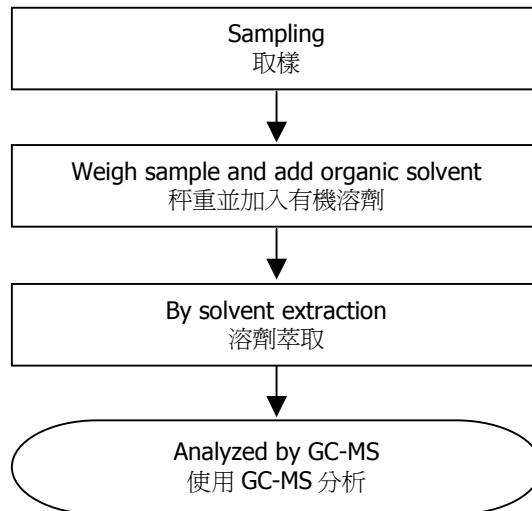


Test Conducted 測試內容 :

Measurement Flowchart 測試流程圖:

Test for Phthalates Content 鄰苯二甲酸酯測試

Reference Method 參考方法: IEC 62321-8:2017

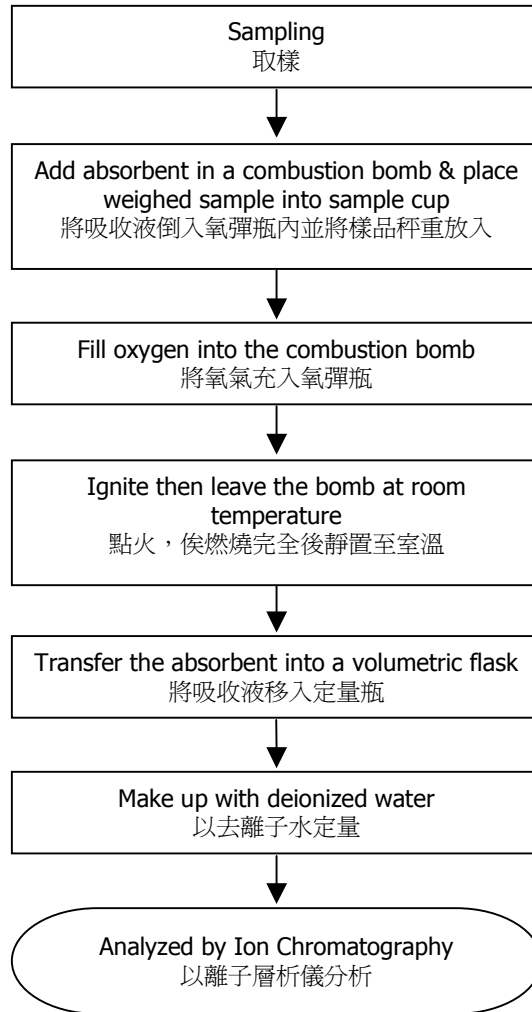


Test Conducted 測試內容 :

Measurement Flowchart 測試流程圖:

Test for Halogen Content 鹵素測試

Reference Method 參考方法 : EN 14582



Test Conducted 測試內容 :

Measurement Flowchart 測試流程圖:

Test for Hexabromocyclododecane (HBCDD) Content 六溴環十二烷
Reference Method 參考方法 : USEPA 3540C

