



鼎翰科技股份有限公司

產品規格書 暨 樣品承認書

1. 產品規格書編號：60-0480003-10LF

2. 品名：Chip Antenna/ SMD 天線 AT9520-B2R4HAAT/LF(嘉光)

3. 產品規格書與樣品承認書履歷：

版次	修訂履歷	ECO 或 ECN 編號	生效日期	樣品料號
A	新訂	——	2015.11.12	60-0480003-10LF

4. 已承認樣品清冊：

項次	樣品料號	版次	製造商 /供應商	承認日期	承認型式		舊樣品處理	
					限量	正式	留用	廢止
1	60-0480003-10LF	A	嘉光	2015.07.17		V		

鼎翰科技股份有限公司
******* 樣品承認書 *******

項次	樣品料號	版次	類別		廠商名稱	品名規格	送樣日期
			製造商	代理商			
1	60-0480003-10LF	A	■		嘉光科技股份有限公司(嘉光科技)	Chip Antenna/ SMD天線 AT9520-B2R4HAAT/LF(嘉光)	2015/07/14

1. 樣品承認測試項目：

A. 採購部：(書面資料需一式2份及樣品2份。除非另有說明樣品數量：)

A.1 送樣目的：新開發 設變 新廠商 廠商設變 備註：

A.2 規格資料：(請勾選)

規格書 供應商測試報告 色卡
材質證明 供應商可靠性測試報告 廠商材料安規證書
廠商承認書 其他 備註：

提案者： 許雅婷 2015/07/14

陳依權 2015/07/14

B. 工程部：

B.1 使用機種：全系列 機種 :MFi BT module for T048 T052
 B.2 樣品測試：免驗 合格 不合格，補充說明：
 B.3 規格確認：符合 不符合 需補充：
 B.4 材質認可：免驗 合格 不合格，材質種類說明：
 B.5 安規認可：不需要 合格 需重測，安規種類說明：
 B.6 模具認可：不需要 合格 不合格，模具種類說明：
 B.7 治具製作：不需治具 需治具，治具種類說明：
 B.8 檢驗重點：不需要 需標示，標示說明：
 B.9 認可結果：允收 拒收，補充說明：

認可者：

何大任 2015/07/17

C. 品保單位：

C.1 樣品測試：免驗 合格 不合格，補充說明：
 C.2 壽命測試：免驗 合格 不合格，補充說明：

認可者：

翁詩婉 2015/10/15

鼎翰科技股份有限公司

D. 品管單位：

- D.1 規格確認：符合 不符合 需補充：
- D.2 安規認可：不需要 符合 不符合，安規種類說明：
- D.3 檢驗重點：不需要 已標示 需重新標示，標示說明：
- D.4 RoHS檢測：允收 拒收，補充說明：
- D.5 認可結果：允收 拒收，補充說明：

認可者： 景昆山 2015/11/10

吳承翰 2015/11/05

2. 產品規格書與樣品承認書發行紀錄：

A. 工程部：

A.1 規格書版別確認：

版次	修訂履歷	ECO 或 ECN 編號	生效日期	樣品料號
A	新訂	_____	2015/11/12	60-0480003-10LF

A.2 樣品版本確認與舊樣品處理：

項次	樣品料號	版次	製造商 /供應商	承認日期	舊樣品處理	
					留用	廢止
1	60-0480003-10LF	A	嘉光科技股份有 限公司	2015/07/17		<input checked="" type="checkbox"/>

A.3 過期樣品回收：研發工程 品保 供應商 其他

認可者：

林婉霖 2015/11/12

GainForce Technology Co.,Ltd

嘉光科技股份有限公司

承認書

APPROVAL SHEET

品名： Chip Antennas
MODEL NAME _____

料號： **60-0480003-10LF**
PART NUMBER **AT9520-B2R4HAAT/LF** _____

客戶名稱： 鼎翰科技股份有限公司
CUSTOMER _____

供應商： 嘉光科技股份有限公司
VENDOR _____

使用機種：
MODEL _____

聯絡人： 高妍希 Joanna

聯絡電話： +886-960-119-101

附件：

ACCESSORIES	<input checked="" type="checkbox"/> 規格書	<input checked="" type="checkbox"/> 樣品
	SPECIFICATION	SAMPLE
	<input checked="" type="checkbox"/> 圖樣	<input type="checkbox"/> 檢驗報告
	DRAWING	TEST REPORT

認可狀況：

(APPROVED STATUS)



樣品版次：**A**

AT9520 Series

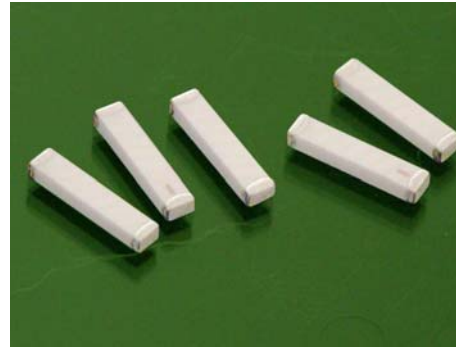
Multilayer Chip Antenna

Features

- ❖ Monolithic SMD with small, low-profile and light-weight type.
- ❖ Wide bandwidth

Applications

- ❖ 2.4GHz WLAN, Home RF, Bluetooth Modules, etc.



Specifications

Part Number	Operating Frequency (MHz)	Peak Gain (XZ-V)	Average Gain (XZ-V)	VSWR	Impedance
AT9520-B2R4HAA_	2400~2500	3.0 dBi typ.	1.0 dBi typ.	2 max.	50 Ω

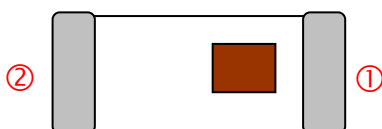
Q'ty/Reel (pcs) : 1000pcs
 Operating Temperature Range : -40 ~ +85 °C
 Storage Temperature Range : +5 ~ +35 °C, Humidity 45~75%RH
 Storage Period : 12 months max.
 Power Capacity : 2W max.

Part Number

AT **9520** - **B** **2R4** **HAA** **□**
 ① ② ③ ④ ⑤ ⑥

① Type	AT : Antenna	② Dimensions (L x W)	9.5x 2.0 mm
③ Material Code	B	④ Initial center frequency	2R4=2400MHz
⑤ Specification Code	HAA	⑥ Packaging	T: Tape & Reel B: Bulk

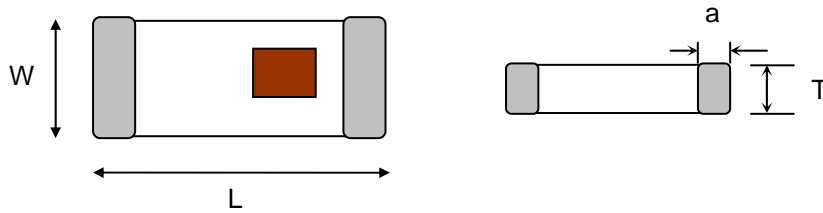
Terminal Configuration



No.	Terminal Name	No.	Terminal Name
①	Feeding Point	②	NC

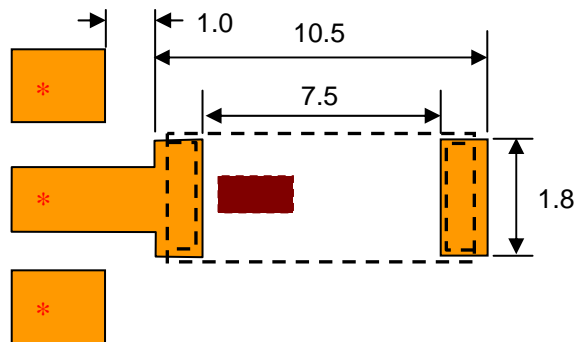
Dimensions and Recommended PC Board Pattern

Unit : mm

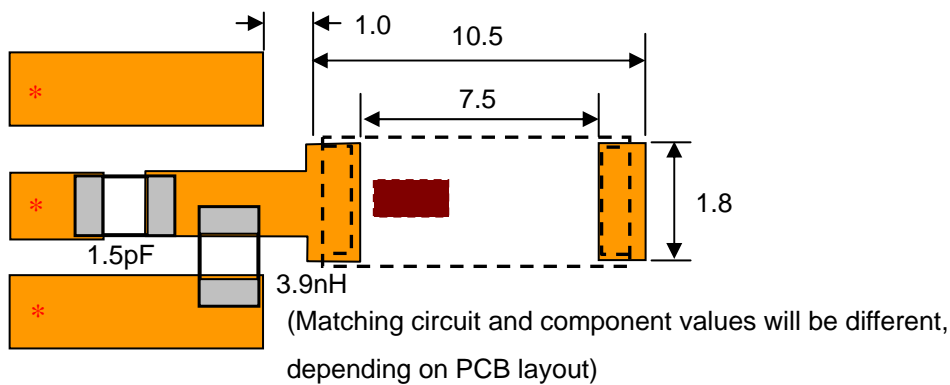


Mark	L	W	T	a
Dimensions	9.5±0.2	2.0±0.2	1.2+ 0.1/-0.2	0.5±0.3

(a) Without Matching Circuits (Moderate Bandwidth)



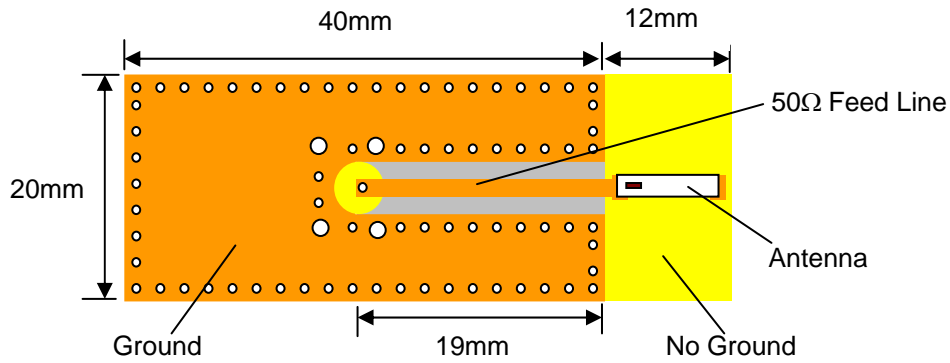
(b) With Matching Circuits (Wide Bandwidth)



*Line width should be designed to match 50Ω characteristic impedance, depending on PCB material and thickness.

Typical Electrical Characteristics (T=25°C)

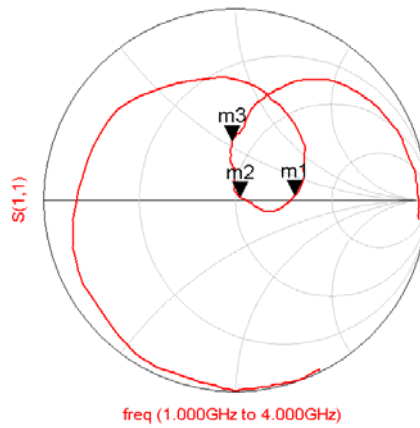
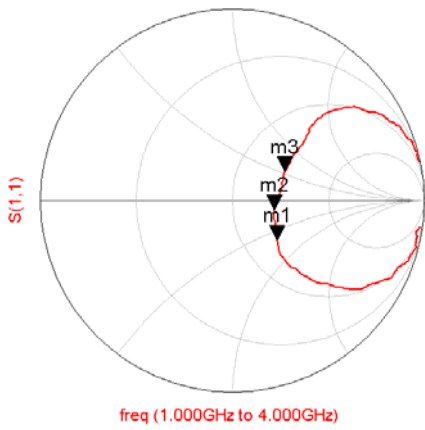
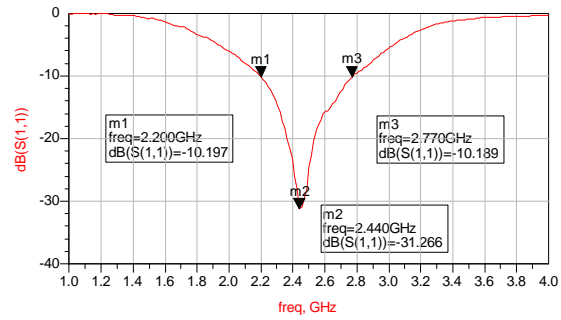
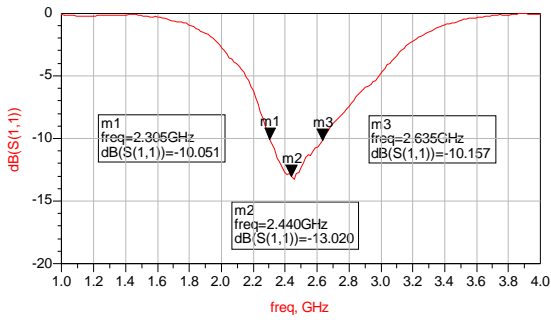
❖ Test Board



❖ Return Loss

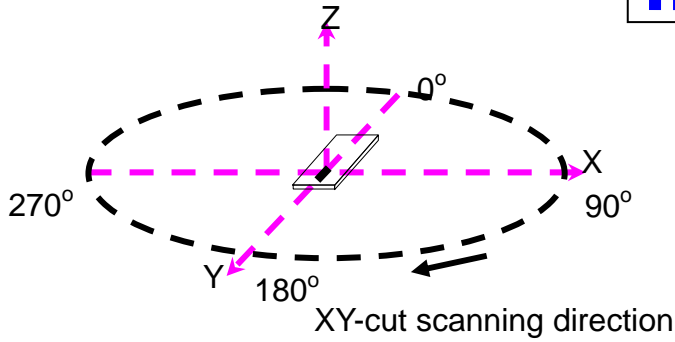
(a) Without Matching Circuits

(b) With Matching Circuits

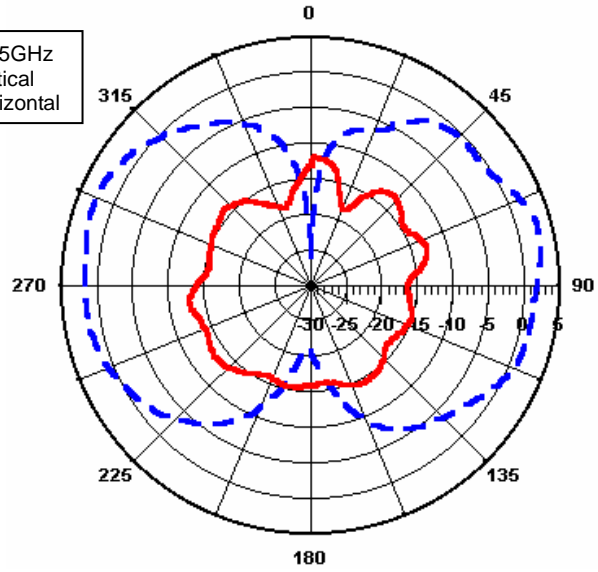


❖ Radiation Patterns

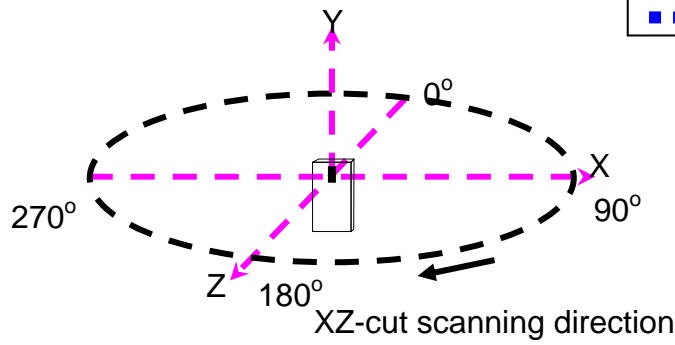
XY-V/XY-H



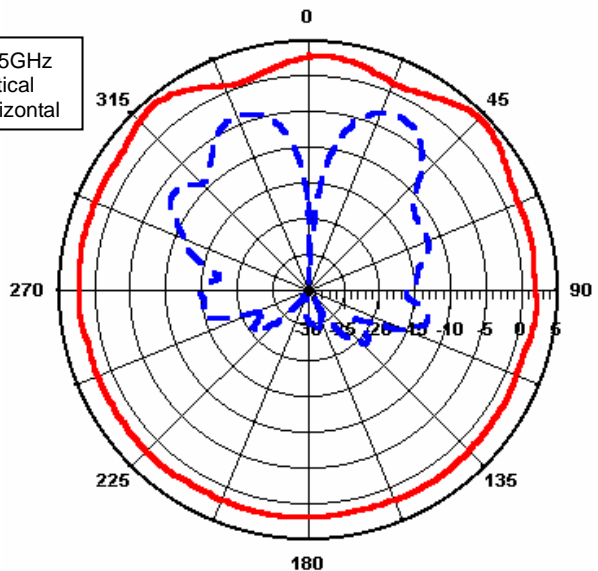
XY cut @2.45GHz
— Vertical
- - - Horizontal



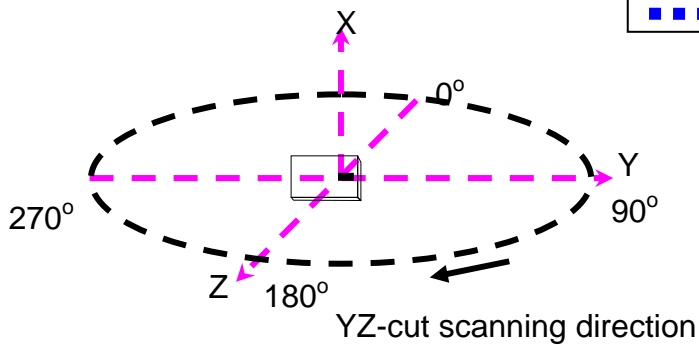
XZ-V/XZ-H



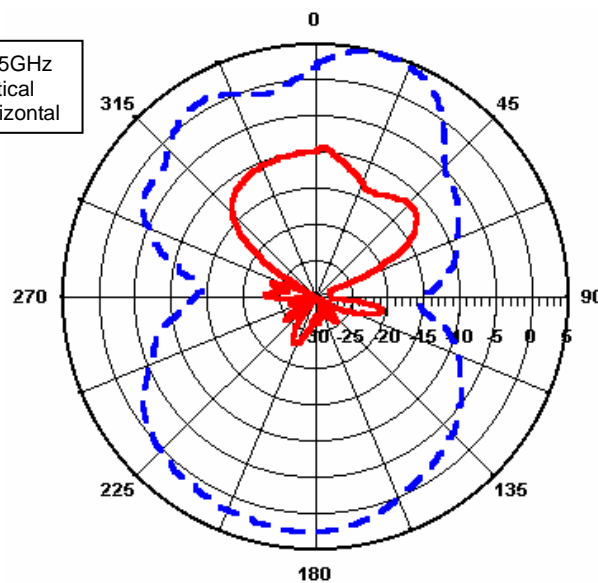
XZ cut @2.45GHz
— Vertical
- - - Horizontal



YZ-V/YZ-H

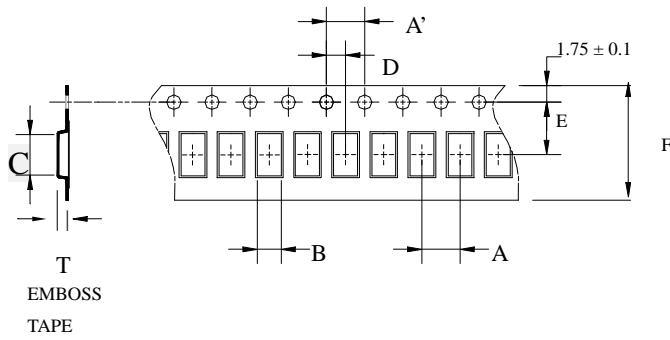


YZ cut @2.45GHz
— Vertical
- - - Horizontal



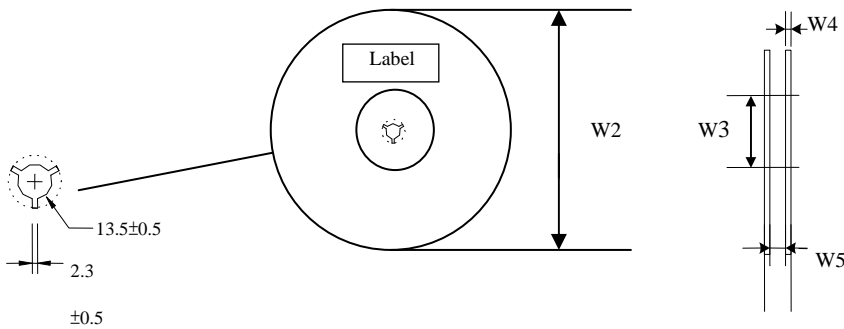
Taping Specifications

❖Tape & Reel Dimensions (Unit: mm) vs. Quantity (pcs)



Type	A	A'	B	C	D	E	F	T	Quantity/per reel	Tape material
AT9520	4.0±	4.0±	2.35±	9.7±	2.0±	7.5±	16.0±	1.40±	1,000pcs	Plastic (Embossed)
	0.1	0.1	0.1	0.1	0.05	0.1	0.1	0.1		

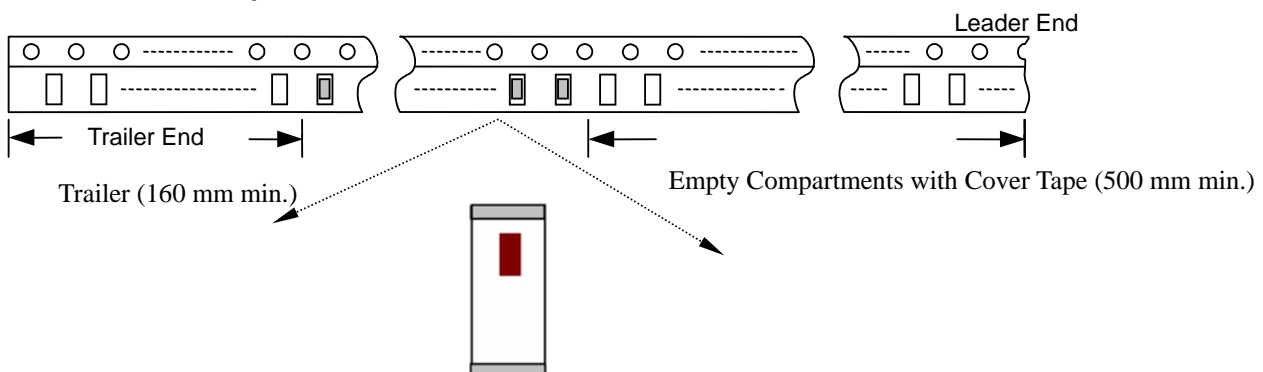
❖Reel Dimensions (Unit: mm)



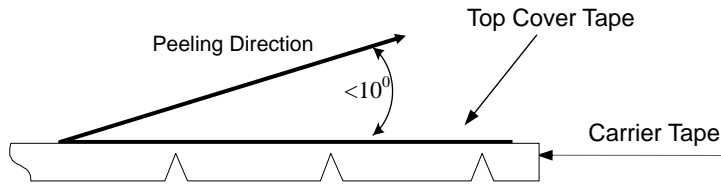
Label: Customer's Name,
ACX P/N, Q'ty, Date,
ACX Corp.

Type	W2	W3	W4	W5
AT9520	178±1	60±1	1.4±0.2	17±0.5

❖Leader and Trailer Tape



❖ **Peel-off Force**



Peel-off force should be in the range of 0.1 – 0.6 N at a peel-off speed of 300 ± 10 mm/min .

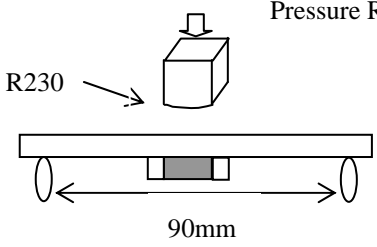
❖ **Storage Conditions**

- (1) Temperature: 15 ~35°C , relative humidity (RH): 45~75%.
- (2) Non-corrosive environment

Notes

❖ The contents of this data sheet are subject to change without notice. Please confirm the specifications and delivery conditions when placing your order.

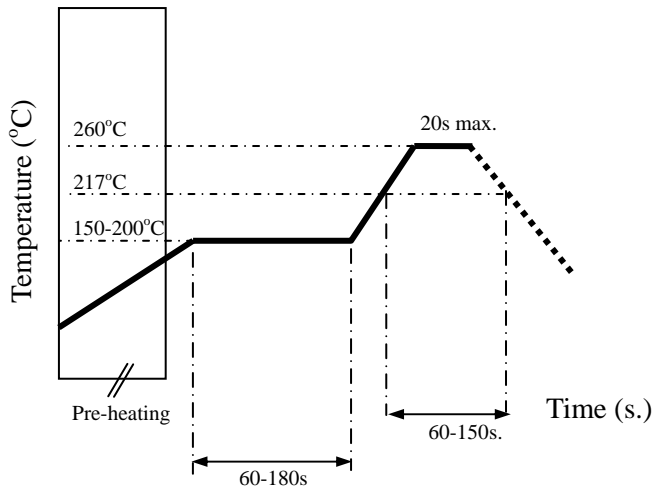
Mechanical & Environmental Characteristics

Item	Requirements	Procedure
Solderability	<ol style="list-style-type: none"> No apparent damage More than 95% of the terminal electrode shall be covered with new solder 	<ol style="list-style-type: none"> Preheat: $120 \pm 5^\circ\text{C}$ Solder: $245 \pm 5^\circ\text{C}$ for 5 ± 1 sec
Soldering strength (Termination Adhesion)	<ol style="list-style-type: none"> 1kg minimum 	<ol style="list-style-type: none"> Solder specimen onto test jig. Apply push force at 0.5mm/s until electrode pads are peeled off or ceramic are broken. Pushing force is applied to longitude direction
Deflection (Substrate Bending)	<ol style="list-style-type: none"> No apparent damage 	<ol style="list-style-type: none"> Solder specimen onto test jig (FR4, 0.8mm) using the recommend soldering profile. Apply a bending force of 1mm deflection 
Heat/Humidity Resistance	<ol style="list-style-type: none"> No apparent damage Fulfill the electrical specification after test 	<ol style="list-style-type: none"> Temperature: $85 \pm 2^\circ\text{C}$ Humidity: 90% ~ 95% RH Duration: 1000 ± 48hrs Recovery: 1-2hrs
Thermal shock (Temperature Cycle)	<ol style="list-style-type: none"> No apparent damage Fulfill the electrical specification after test 	<ol style="list-style-type: none"> One cycle/step 1 : $125 \pm 5^\circ\text{C}$ for 30 min step 2 : $-40 \pm 5^\circ\text{C}$ for 30 min No of cycles : 100 Recovery: 1-2 hrs
Low Temperature Resistance	<ol style="list-style-type: none"> No apparent damage Fulfill the electrical specification after test 	<ol style="list-style-type: none"> Temperature: $-40 \pm 5^\circ\text{C}$ Duration: 500 ± 24hrs Recovery: 1-2hrs

Soldering Conditions

❖ Typical Soldering Profile for Lead-free Process

Reflow Soldering :



Notes

❖ The contents of this data sheet are subject to change without notice. Please confirm the specifications and delivery conditions when placing your order.

Advanced Ceramic X Corp.

16 Tzu Chiang Road, Hsinchu Industrial District Hsinchu Hsien 303, Taiwan

TEL:886-3-5987008 FAX:886-3-5987001

E-mail: acx@acxc.com.tw

<http://www.acxc.com.tw>

Test Report

No. : CE/2014/22200

Date : 2014/02/19

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ADVANCED CERAMIC X (ACX) CORPORATION
16, TZU CHIANG ROAD, HSINCHU INDUSTRIAL DISTRICT, HSINCHU HSIEN, TAIWAN 303



The following sample(s) was/were submitted and identified by/on behalf of the applicant as :

Sample Submitted By : ADVANCED CERAMIC X (ACX) CORPORATION
Sample Description : MULTILAYER LTCC-A COMPONENTS
Style/Item No. : AD SERIES, AT SERIES, BD SERIES, BF SERIES, BL SERIES, BM SERIES, BW SERIES, CD SERIES, CF SERIES, CP SERIES, DM SERIES, DP SERIES, DS SERIES, EF SERIES, ES SERIES, FA SERIES, FB SERIES, FD SERIES, FM SERIES, GS SERIES, HI SERIES, HF SERIES, HM SERIES, HS SERIES, LF SERIES, OM SERIES, OS SERIES, PD SERIES, NF SERIES, QS SERIES, SF SERIES, TS SERIES, TP SERIES, LTCC SUBSTRATES
Sample Receiving Date : 2014/02/12
Testing Period : 2014/02/12 TO 2014/02/19

=====
Test Requested : (1) As specified by client, with reference to RoHS Directive 2011/65/EU Annex II to determine Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs contents in the submitted sample.
(2) As specified by client, to test Halogen-Fluorine, Chlorine, Bromine, Iodine contents in the submitted sample.
Test Method : Please refer to next page(s).
Test Result(s) : Please refer to next page(s).



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

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ADVANCED CERAMIC X (ACX) CORPORATION

16, TZU CHIANG ROAD, HSINCHU INDUSTRIAL DISTRICT, HSINCHU HSIEN, TAIWAN 303



Test Result(s)

PART NAME No.1 : MULTILAYER LTCC-A COMPONENTS

Test Item(s)	Unit	Method	MDL	Result
				No.1
Cadmium (Cd)	mg/kg	With reference to IEC 62321-5: 2013 and performed by ICP-AES.	2	n.d.
Lead (Pb)	mg/kg	With reference to IEC 62321-5: 2013 and performed by ICP-AES.	2	16
Mercury (Hg)	mg/kg	With reference to IEC 62321-4: 2013 and performed by ICP-AES.	2	n.d.
Hexavalent Chromium Cr(VI)	mg/kg	With reference to IEC 62321: 2008 and performed by UV-VIS.	2	n.d.
Sum of PBBs			-	n.d.
Monobromobiphenyl			5	n.d.
Dibromobiphenyl			5	n.d.
Tribromobiphenyl			5	n.d.
Tetrabromobiphenyl			5	n.d.
Pentabromobiphenyl			5	n.d.
Hexabromobiphenyl			5	n.d.
Heptabromobiphenyl			5	n.d.
Octabromobiphenyl			5	n.d.
Nonabromobiphenyl			5	n.d.
Decabromobiphenyl			5	n.d.
Sum of PBDEs			-	n.d.
Monobromodiphenyl ether			5	n.d.
Dibromodiphenyl ether			5	n.d.
Tribromodiphenyl ether			5	n.d.
Tetrabromodiphenyl ether			5	n.d.
Pentabromodiphenyl ether			5	n.d.
Hexabromodiphenyl ether			5	n.d.
Heptabromodiphenyl ether			5	n.d.
Octabromodiphenyl ether			5	n.d.
Nonabromodiphenyl ether			5	n.d.
Decabromodiphenyl ether			5	n.d.

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ADVANCED CERAMIC X (ACX) CORPORATION

16, TZU CHIANG ROAD, HSINCHU INDUSTRIAL DISTRICT, HSINCHU HSIEN, TAIWAN 303



Test Item(s)	Unit	Method	MDL	Result
				No.1
Halogen				
Halogen-Fluorine (F) (CAS No.: 14762-94-8)	mg/kg	With reference to BS EN 14582:2007. Analysis was performed by IC.	50	n.d.
Halogen-Chlorine (Cl) (CAS No.: 22537-15-1)			50	n.d.
Halogen-Bromine (Br) (CAS No.: 10097-32-2)			50	n.d.
Halogen-Iodine (I) (CAS No.: 14362-44-8)			50	n.d.

Note :

1. mg/kg = ppm ; 0.1wt% = 1000ppm
2. n.d. = Not Detected
3. MDL = Method Detection Limit
4. " - " = Not Regulated

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Test Report

No. : CE/2014/22200

Date : 2014/02/19

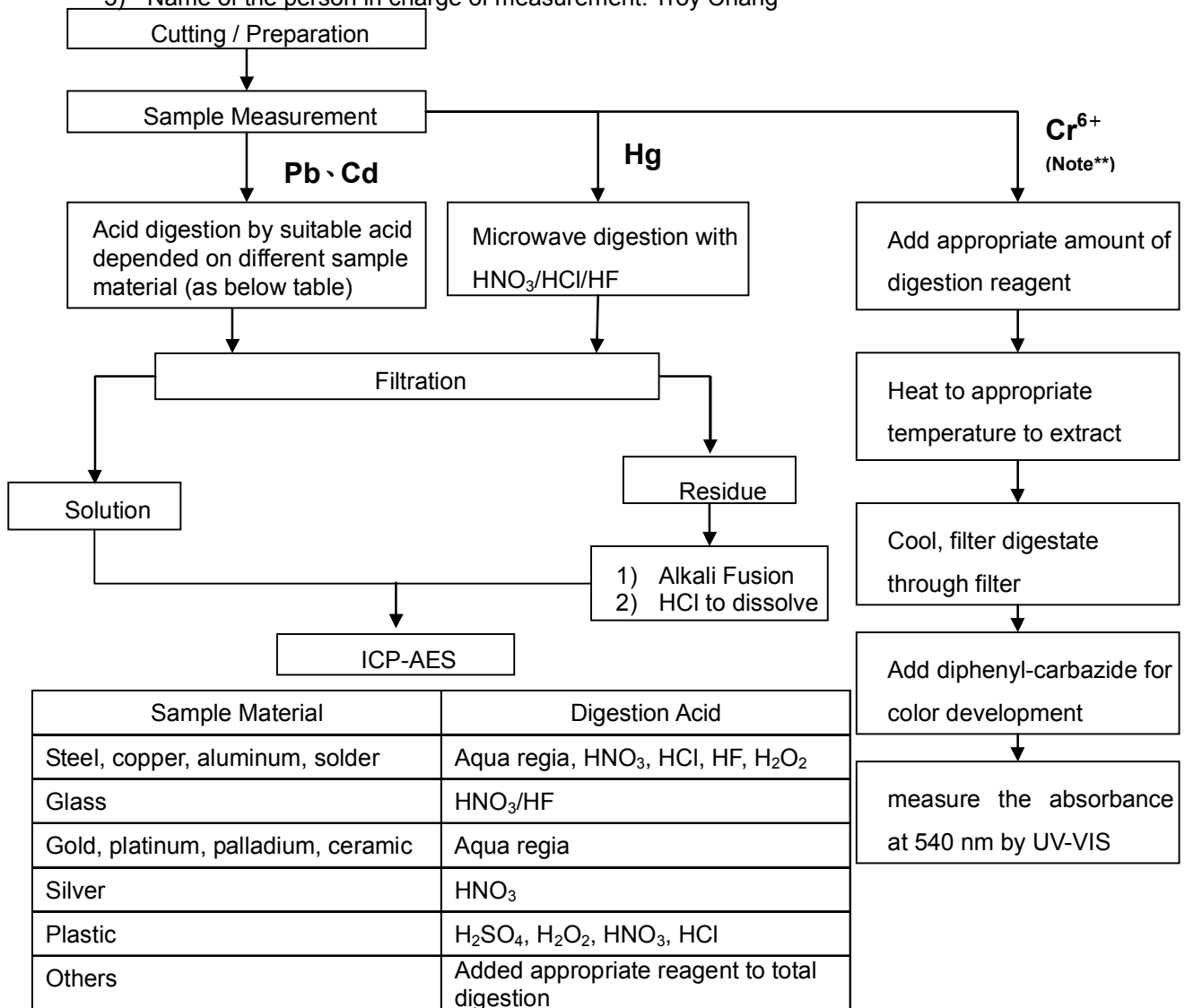
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ADVANCED CERAMIC X (ACX) CORPORATION

16, TZU CHIANG ROAD, HSINCHU INDUSTRIAL DISTRICT, HSINCHU HSIEN, TAIWAN 303



- 1) These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr⁶⁺ test method excluded)
- 2) Name of the person who made measurement: Climbgreat Yang
- 3) Name of the person in charge of measurement: Troy Chang



Note :** (1) For non-metallic material, add alkaline digestion reagent and heat to 90~95°C.
 (2) For metallic material, add pure water and heat to boiling.

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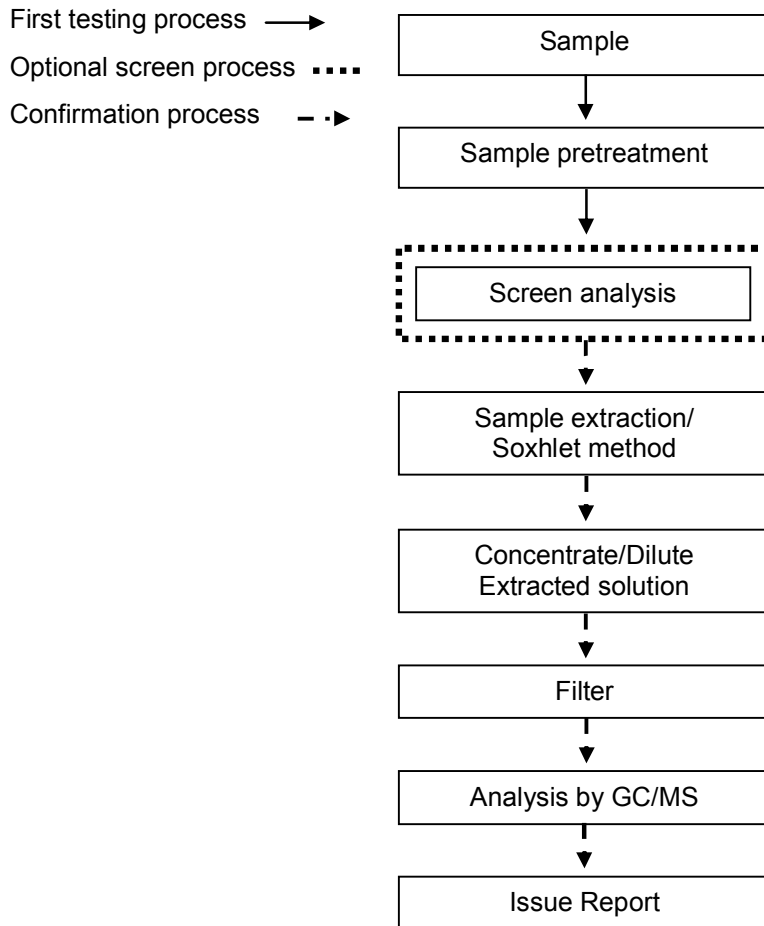
ADVANCED CERAMIC X (ACX) CORPORATION

16, TZU CHIANG ROAD, HSINCHU INDUSTRIAL DISTRICT, HSINCHU HSIEN, TAIWAN 303



PBB/PBDE analytical FLOW CHART

- Name of the person who made measurement: Roman Wong
- Name of the person in charge of measurement: Troy Chang



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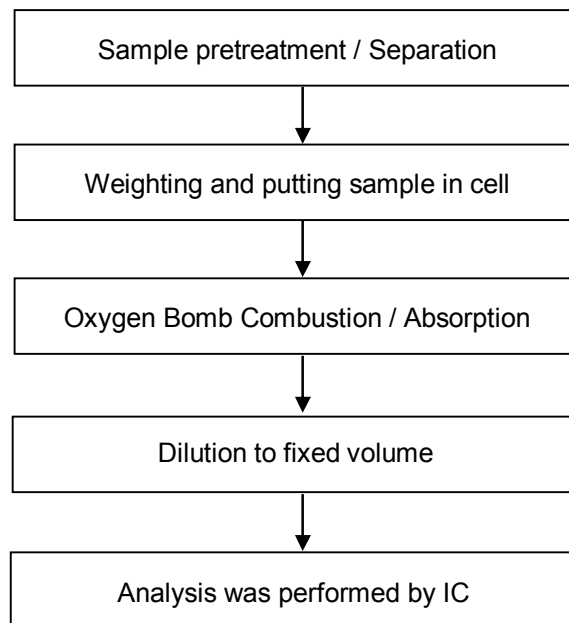
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16, TZU CHIANG ROAD, HSINCHU INDUSTRIAL DISTRICT, HSINCHU HSIEN, TAIWAN 303



Analytical flow chart of halogen content

- Name of the person who made measurement: Rita Chen
- Name of the person in charge of measurement: Troy Chang



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Test Report

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Date : 2014/02/19

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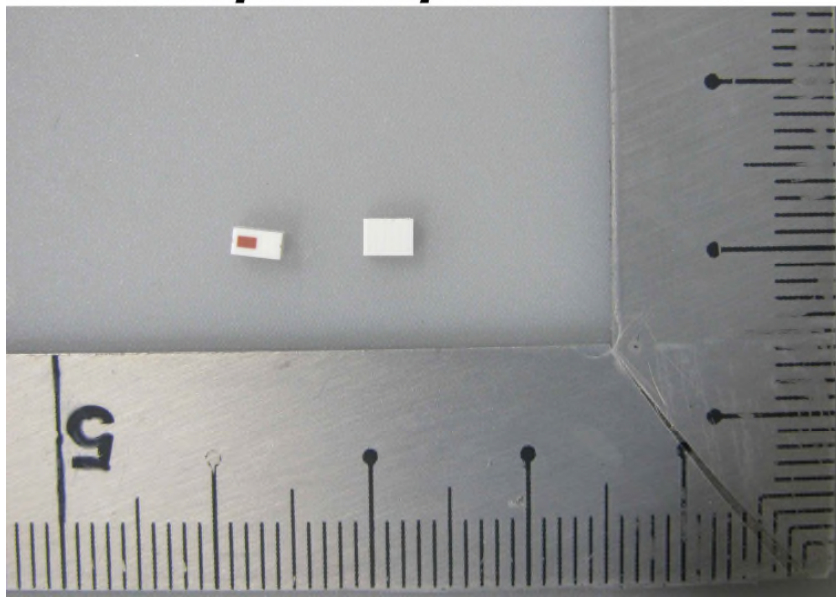
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* The tested sample / part is marked by an arrow if it's shown on the photo. *

CE/2014/22200



** End of Report **

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TEL : 886-3-5987008 FAX : 886-3-5987001
Web site: www.acxc.com.tw E-mail : acx@acxc.com.tw

CERTIFICATE OF COMPLIANCE

PART NUMBER : AT9520-B2R4HAAT/LF
LOT NUMBER : 150811035-0X
MEASURED DATE : 2015/7/9
MEASUREMENT EQUIPMENT : HP8722D

TEST	CRITERIA	RESULT
VSWR	< 2 @ 2400~2500MHz	PASS
Peak Gain(XZ-V)	3.0dBi typ. @2400~2500MHz	PASS
Average Gain(XZ-V)	1.0dBi typ.@2400~2500MHz	PASS

Approved by:

張丹寧

Inspected by:

張玉珍



TSC Auto ID Technology Co., Ltd.

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有害物質不使用保證書

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有害物質不使用聲明：

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We hereby certify that the raw materials or products which shipped by us will comply with the following European regulations, and to the best of our knowledge, determined that none of the restrict substances are present in TSC products in amounts above 0.1% by weight.

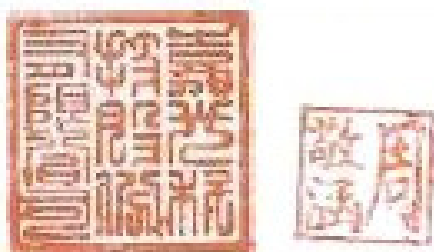
1. Substance of Very High Concern (SVHC) Candidate List of EU Regulation 1907/2006 concerning the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH)
2. Joint Industry Guide No. JIG-101 Ed. 4.1

公 司 名 稱：嘉光科技股份有限公司
(Company Name)

公 司 負 責 人：周敬涵
(Company Representative)

填 寫 日 期：2015/5/15
(Date)

公 司 大 小 章：
(Company Stamp)





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We declare that the raw materials or products which shipped by us will comply with The European Directive 2011/65/EU (Restriction of the use of Certain Hazardous Substance in Electrical and Electronic Equipment) which prohibits the following substance in electrical and electronic equipment.

1. Lead (Pb): Less than 1,000 ppm (鉛)
2. Cadmium (Cd) : Less than 100 ppm (鎘)
3. Mercury (Hg) : Less than 1, 000 ppm. (汞)
4. Hexavalent Chrome (CrVI) : Less than 1,000 ppm (六價鉻)
5. Polybrominated Biphenyle (PBB) : Less than 1000 ppm (聚溴聯苯)
6. Polybrominated Diphenyl Ethers (PBDE) : Less than 1000 ppm (聚溴二苯醚)

公 司 名 稱 : 嘉光科技股份有限公司
(Company Name)

公 司 負 責 人 : 周敬涵
(Company Representative)

填 寫 日 期 : 2015/5/15
(Date)

公 司 大 小 章 :
(Company Stamp)

