

GainForce Technology Co.,Ltd

嘉光科技股份有限公司

承認書

APPROVAL SHEET

品 名： Multilayer Chip Antenna
MODEL NAME _____
料 號： AT3216-B2R7HAAT/LF
PAT NUMBER 3.2*1.6mm Multilayer Chip Antenna
客戶名稱： 晶訊科技股份有限公司
CUSTOMER _____
供 應 商： 嘉光科技股份有限公司
VENDOR _____
承認料號： _____
Approve P/N _____
使用機種： _____
MODEL _____
聯 絡 人： 許志遠 DENNIS
聯絡電話： +886-915-296-557

附 件：

ACCESSORIES ☒ 規格書

SPECIFICATION

☐ 圖樣

DRAWING

☐ 樣品

SAMPLE

☒ 檢驗報告

TEST REPORT

認可狀況：

(APPROVED STATUS)

AT3216 Series

Multilayer Chip Antenna

Features

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

Applications

- ❖ Bluetooth/Wireless LAN/Home RF
- ❖ ISM band 2.4GHz applications



Specifications

Part Number	Frequency Range (MHz)	Peak Gain (XZ-V)	Average Gain (XZ-V)	VSWR	Impedance
AT3216 -B2R7HAA	2400 ~ 2500	0.5 dBi typ.	-0.5 dBi typ.	2 max.	50 Ω

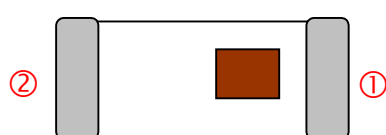
Q'ty/Reel (pcs) : 3,000pcs
 Operating Temperature Range : -40 ~ +85 °C
 Storage Temperature Range : -40 ~ +85 °C
 Power Capacity : 3W max.

Part Number

AT 3216 - B 2R7 HAA □ /LF
 ① ② ③ ④ ⑤ ⑥ ⑦

① Type	AT : Antenna	② Dimensions (L × W)	3.2× 1.6 mm
③ Material Code	B	④ Frequency Range	2R7=2700MHz
⑤ Specification Code	HAA	⑥ Packaging	T: Tape & Reel B: Bulk
⑦ Soldering	=lead-containing /LF=lead-free		

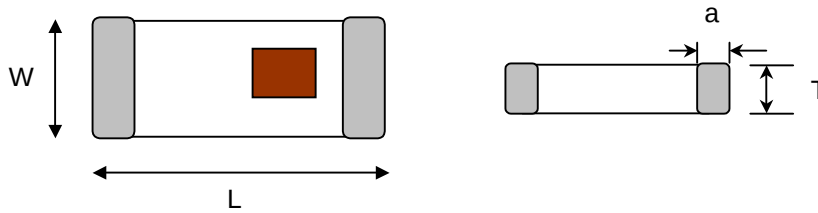
Terminal Configuration



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

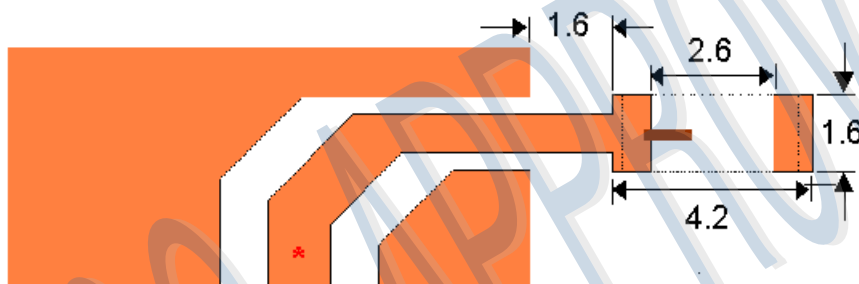
Dimensions and Recommended PC Board Pattern

Unit : mm

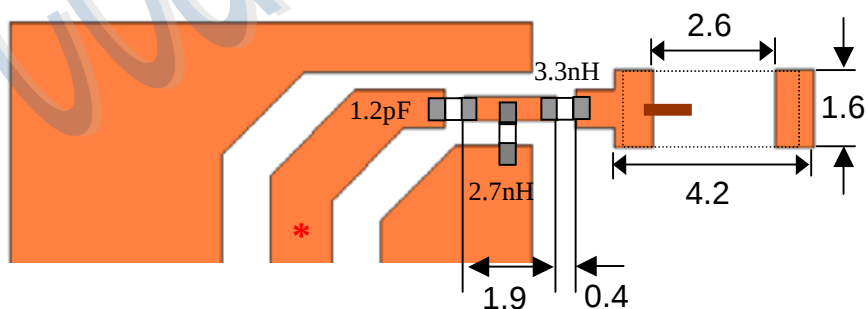


Mark	L	W	T	a
Dimensions	3.2 ± 0.2	1.6 ± 0.2	$1.3 + 0.1 / - 0.2$	0.5 ± 0.3

(a) Without Matching Circuits



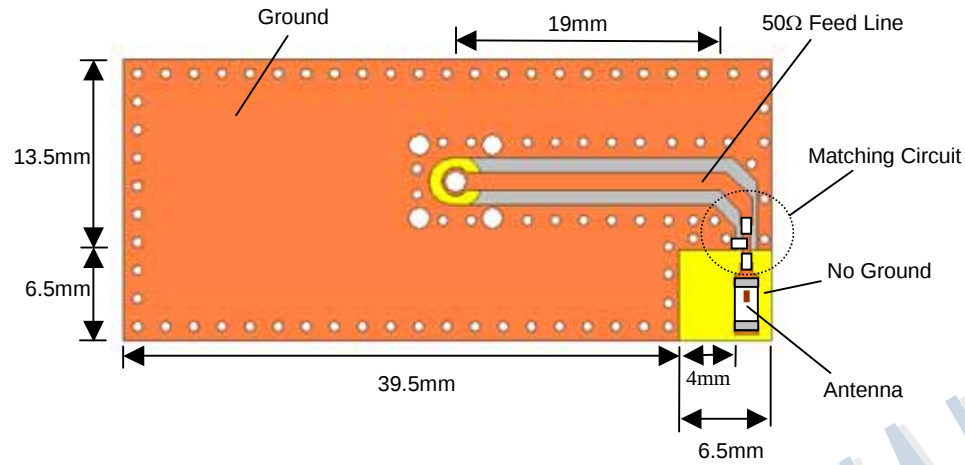
(b) With Matching Circuits



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

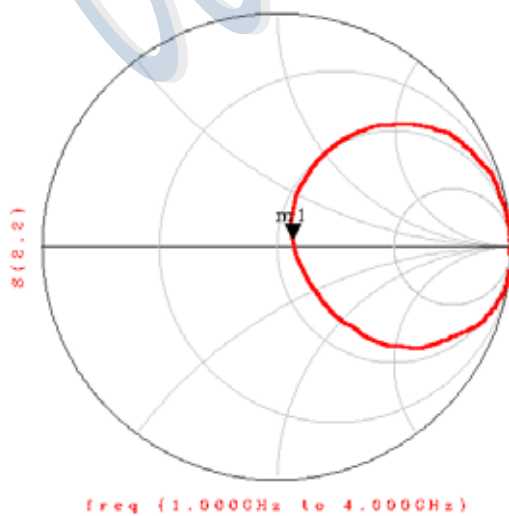
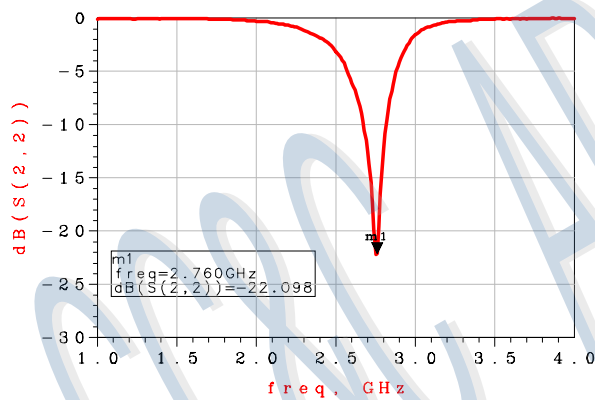
Typical Electrical Characteristics (T=25°C)

❖ Test Board

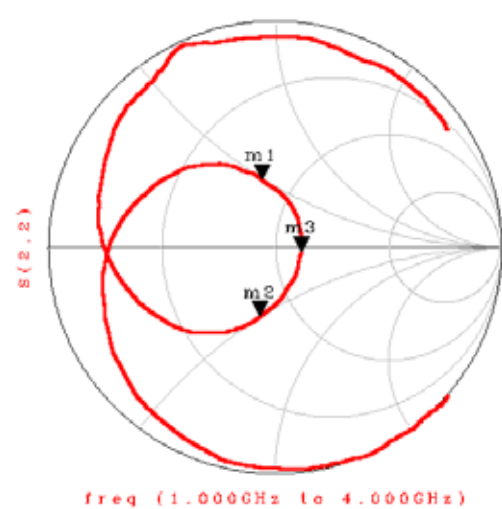
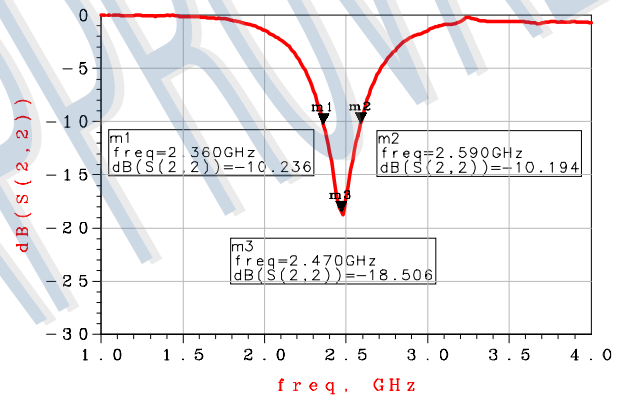


❖ Return Loss

(a) Without Matching Circuits



(b) With Matching Circuits



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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 client as :

Sample Description : MULTILAYER LTCC-A COMPONENTS (CERAMIC BODY)
Style/Item No. : AD SERIES, AM SERIES, AT SERIES, AW SERIES, BD SERIES, BF SERIES, BL SERIES, BM SERIES, CD SERIES, CF SERIES, CP SERIES, DM SERIES, DP SERIES, DS SERIES, FA SERIES, FB SERIES, FD SERIES, HI SERIES, HF SERIES, HM SERIES, HS SERIES, LF SERIES, PD SERIES, NF SERIES, QS SERIES, SF SERIES, TS SERIES, LTCC SUBSTRATES, BCM2037
Buyer/Order No. : LOCAL COMPANY OR USA COMPANY
Sample Receiving Date : 2010/02/25
Testing Period : 2010/02/25 TO 2010/03/04

Test Requested : In accordance with the RoHS Directive 2002/95/EC, and its amendment directives.

Test Method : With reference to IEC 62321: 2008
Procedures for the Determination of Levels of Regulated Substances in Electrotechnical Products.
(1) Determination of Cadmium by ICP-AES.
(2) Determination of Lead by ICP-AES.
(3) Determination of Mercury by ICP-AES.
(4) Determination of Hexavalent Chromium by UV/Vis Spectrometry.
(5) Determination of PBB and PBDE by GC/MS.

Test Result(s) : Please refer to next page(s).


Chenyu Kung / Operation Manager
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 results by chemical method (Unit: mg/kg)

Test Item (s):	Method (Refer to)	Result	MDL
		No.1	
Cadmium (Cd)	(1)	n.d.	2
Lead (Pb)	(2)	38	2
Mercury (Hg)	(3)	n.d.	2
Hexavalent Chromium Cr(VI) by alkaline extraction	(4)	n.d.	2
Sum of PBBs	(5)	n.d.	-
Monobromobiphenyl		n.d.	5
Dibromobiphenyl		n.d.	5
Tribromobiphenyl		n.d.	5
Tetrabromobiphenyl		n.d.	5
Pentabromobiphenyl		n.d.	5
Hexabromobiphenyl		n.d.	5
Heptabromobiphenyl		n.d.	5
Octabromobiphenyl		n.d.	5
Nonabromobiphenyl		n.d.	5
Decabromobiphenyl		n.d.	5
Sum of PBDEs		n.d.	-
Monobromodiphenyl ether		n.d.	5
Dibromodiphenyl ether		n.d.	5
Tribromodiphenyl ether		n.d.	5
Tetrabromodiphenyl ether		n.d.	5
Pentabromodiphenyl ether		n.d.	5
Hexabromodiphenyl ether		n.d.	5
Heptabromodiphenyl ether		n.d.	5
Octabromodiphenyl ether		n.d.	5
Nonabromodiphenyl ether		n.d.	5
Decabromodiphenyl ether		n.d.	5

TEST PART DESCRIPTION:

NO.1 : MIXED ALL PARTS

Note : 1. mg/kg = ppm; 0.1wt% = 1000ppm

2. n.d. = Not Detected

3. MDL = Method Detection Limit

4. "-" = Not Regulated

5. 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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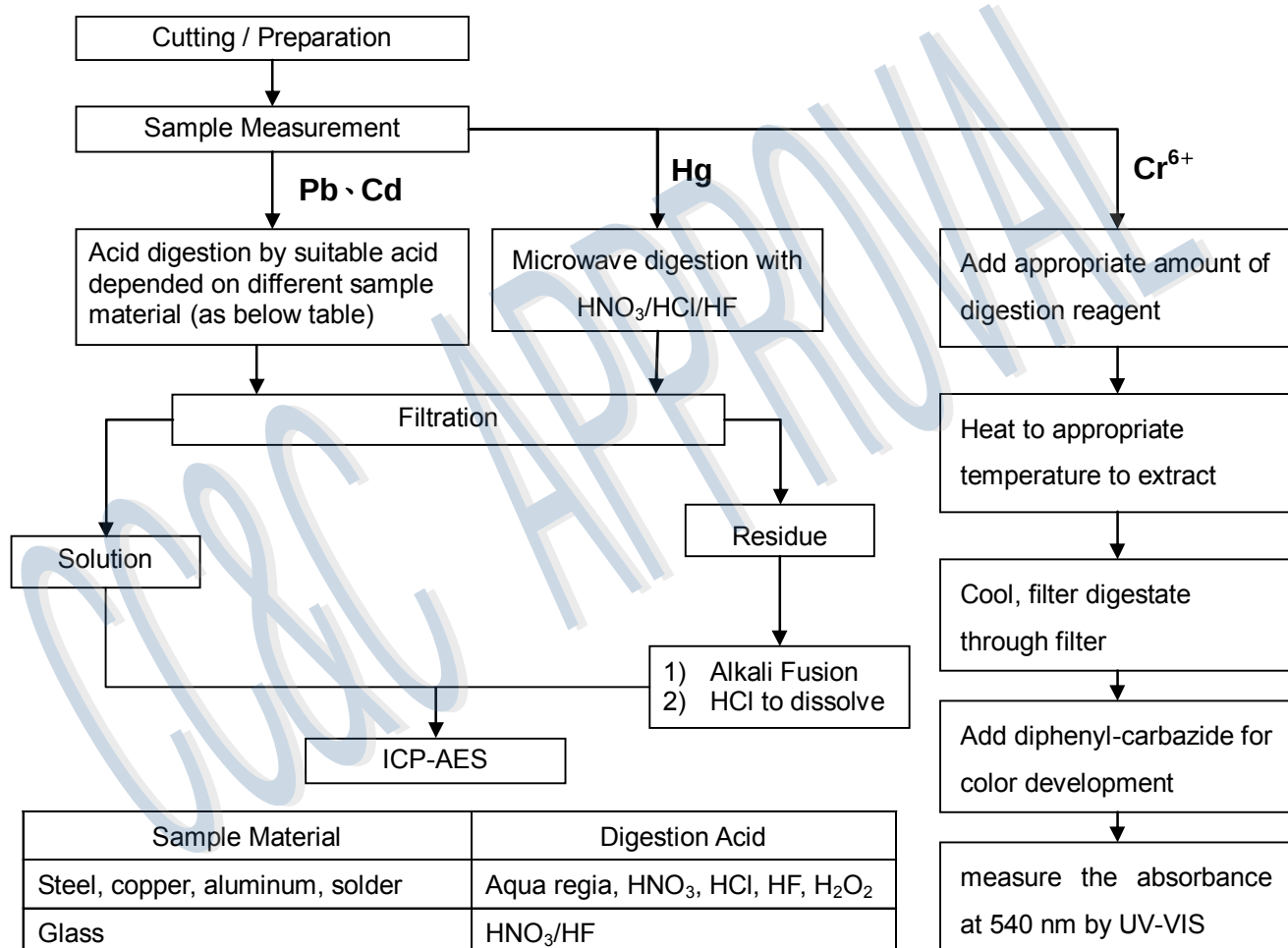
Date : 2010/03/04

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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



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



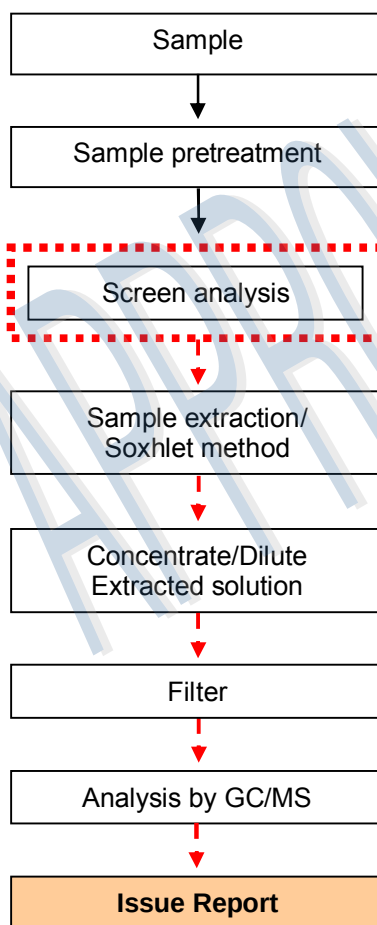
PBB/PBDE analytical FLOW CHART

- 1) Name of the person who made measurement: Roman Wong
- 2) Name of the person in charge of measurement: Shinjyh Chen

First testing process →

Optional screen process →

Confirmation process - - - - - →



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



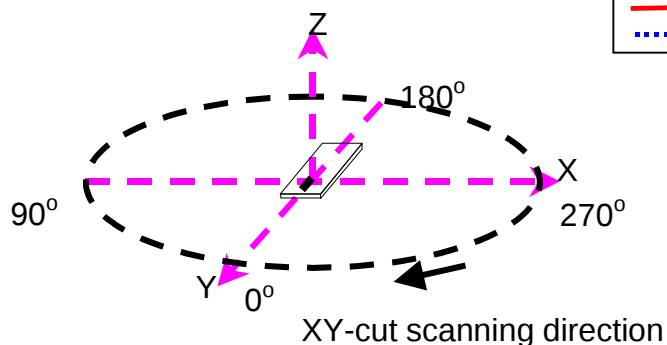
**** End of Report ****

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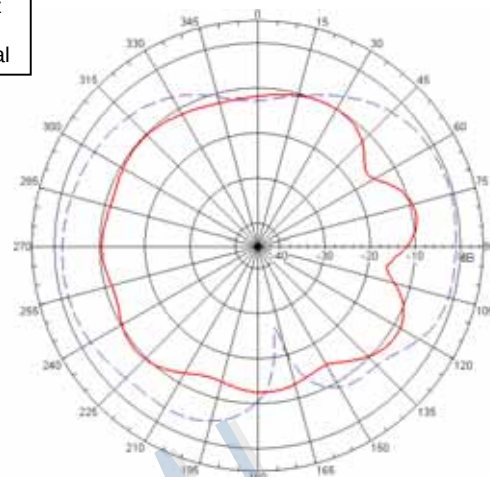
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Radiation Patterns

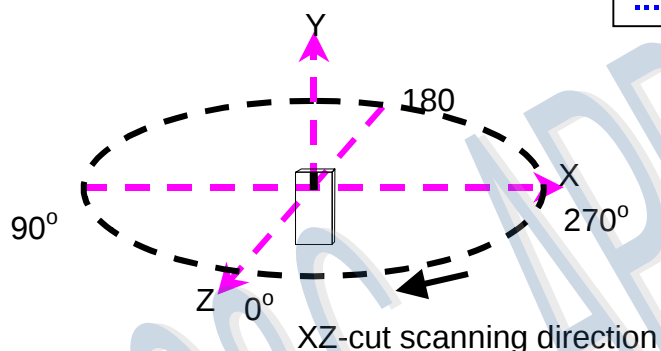
XY-V/XY-H



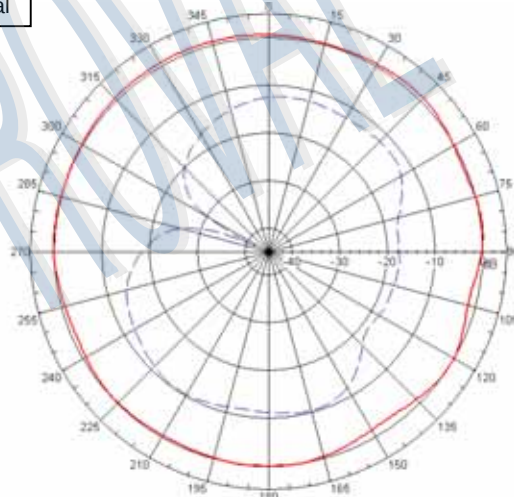
XY cut @2.45GHz
— Vertical
... Horizontal



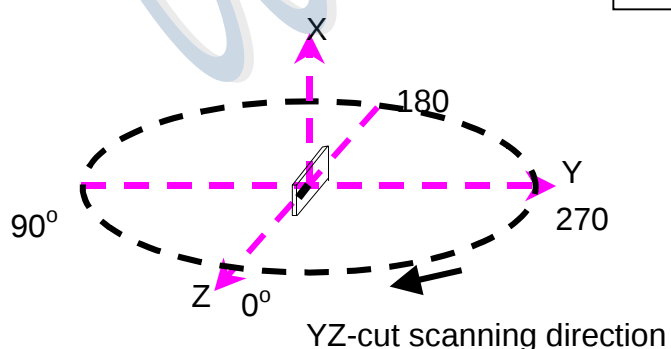
XZ-V/XZ-H



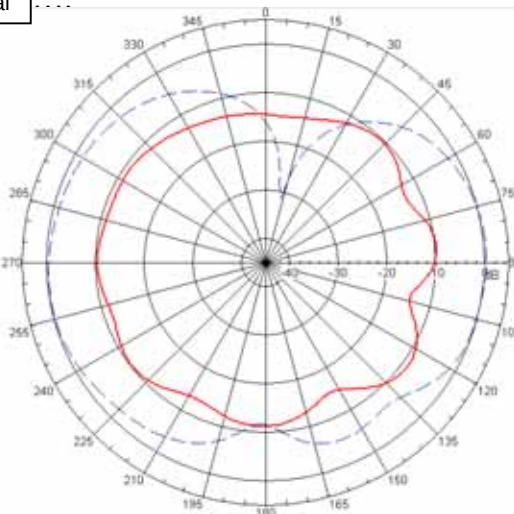
XZ cut @2.45GHz
— Vertical
... Horizontal



YZ-V/YZ-H



YZ cut @2.45GHz
— Vertical
... Horizontal



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/2010/50443

Date : 2010/05/11

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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 client as :

Sample Description : TERMINATION MATERIAL
Style/Item No. : AD SERIES, AM SERIES, AT SERIES, AW SERIES, BD SERIES, BF SERIES, BL SERIES, BM SERIES, CD SERIES, CF SERIES, CP SERIES, DM SERIES, DP SERIES, DS SERIES, FA SERIES, FB SERIES, FD SERIES, HI SERIES, HF SERIES, HM SERIES, HS SERIES, LF SERIES, PD SERIES, NF SERIES, QS SERIES, SF SERIES, TS SERIES, LTCC SUBSTRATES, BCM2037
Buyer/Order No. : LOCAL COMPANY OR USA COMPANY
Sample Receiving Date : 2010/05/04
Testing Period : 2010/05/04 TO 2010/05/11

Test Requested : In accordance with the RoHS Directive 2002/95/EC, and its amendment directives.
Test Method : With reference to IEC 62321: 2008 Procedures for the Determination of Levels of Regulated Substances in Electrotechnical Products.
(1) Determination of Cadmium by ICP-AES.
(2) Determination of Lead by ICP-AES.
(3) Determination of Mercury by ICP-AES.
(4) Determination of Hexavalent Chromium by Spot test / boiling water extraction Method.
(5) Determination of PBB and PBDE by GC/MS.

Test Result(s) : Please refer to next page(s).


Chenyu Kung / Operation Manager
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 results by chemical method (Unit: mg/kg)

Test Item (s):	Method (Refer to)	Result	MDL
		No.1	
Cadmium (Cd)	(1)	n.d.	2
Lead (Pb)	(2)	n.d.	2
Mercury (Hg)	(3)	n.d.	2
Hexavalent Chromium Cr(VI) by Spot test / boiling water extraction	(4)	Negative	See Note 4
Sum of PBBs	(5)	n.d.	-
Monobromobiphenyl		n.d.	5
Dibromobiphenyl		n.d.	5
Tribromobiphenyl		n.d.	5
Tetrabromobiphenyl		n.d.	5
Pentabromobiphenyl		n.d.	5
Hexabromobiphenyl		n.d.	5
Heptabromobiphenyl		n.d.	5
Octabromobiphenyl		n.d.	5
Nonabromobiphenyl		n.d.	5
Decabromobiphenyl		n.d.	5
Sum of PBDEs		n.d.	-
Monobromodiphenyl ether		n.d.	5
Dibromodiphenyl ether		n.d.	5
Tribromodiphenyl ether		n.d.	5
Tetrabromodiphenyl ether		n.d.	5
Pentabromodiphenyl ether		n.d.	5
Hexabromodiphenyl ether		n.d.	5
Heptabromodiphenyl ether		n.d.	5
Octabromodiphenyl ether		n.d.	5
Nonabromodiphenyl ether		n.d.	5
Decabromodiphenyl ether		n.d.	5

TEST PART DESCRIPTION:

NO.1 : GRAY PLATING LAYER

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



Note : 1. mg/kg = ppm; 0.1wt% = 1000ppm

2. n.d. = Not Detected

3. MDL = Method Detection Limit

4. Spot-test:

Negative = Absence of Cr(VI) coating / surface layer,

Positive = Presence of Cr(VI) coating / surface layer;

(The tested sample should be further verified by boiling-water-extraction method if the spot test result cannot be confirmed.)

Boiling-water-extraction:

Negative = Absence of Cr(VI) coating / surface layer.

Positive = Presence of Cr(VI) coating / surface layer;

the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm² sample surface area.

5. "-" = Not Regulated

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No. : CE/2010/50443

Date : 2010/05/11

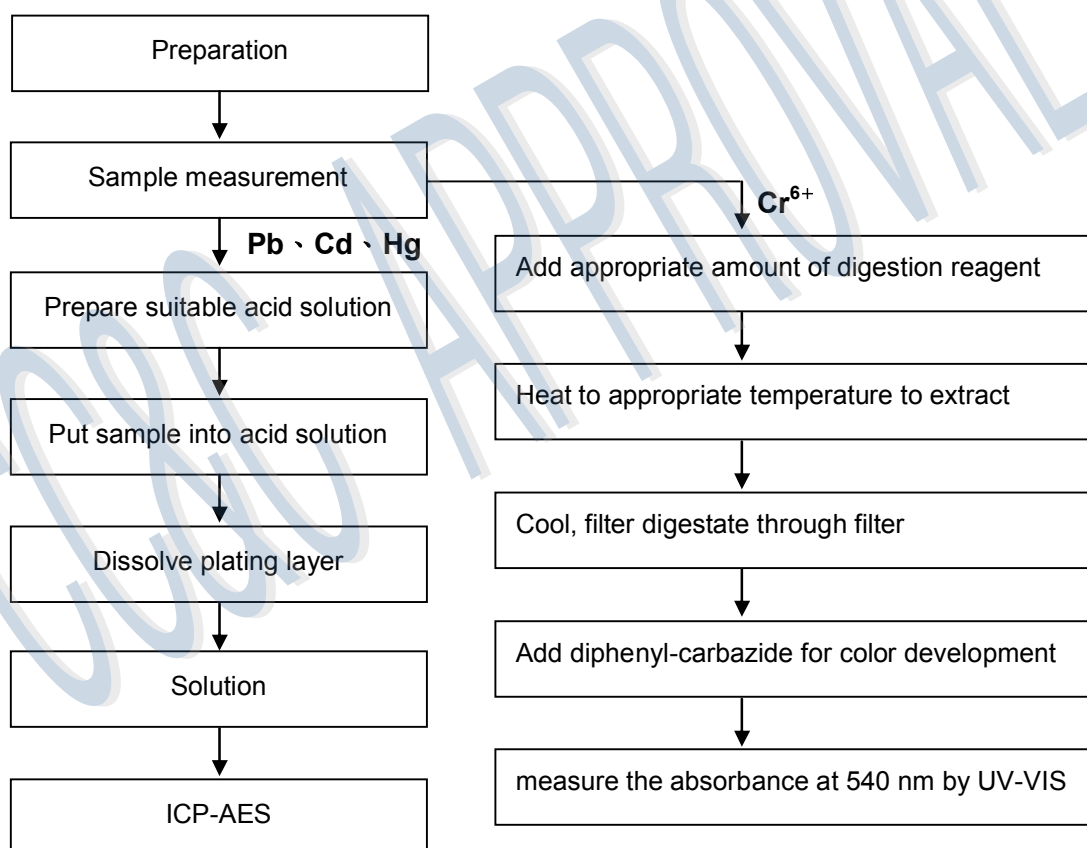
Page : 4 of 6

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

Flow Chart of Stripping method for metal analysis



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No. : CE/2010/50443

Date : 2010/05/11

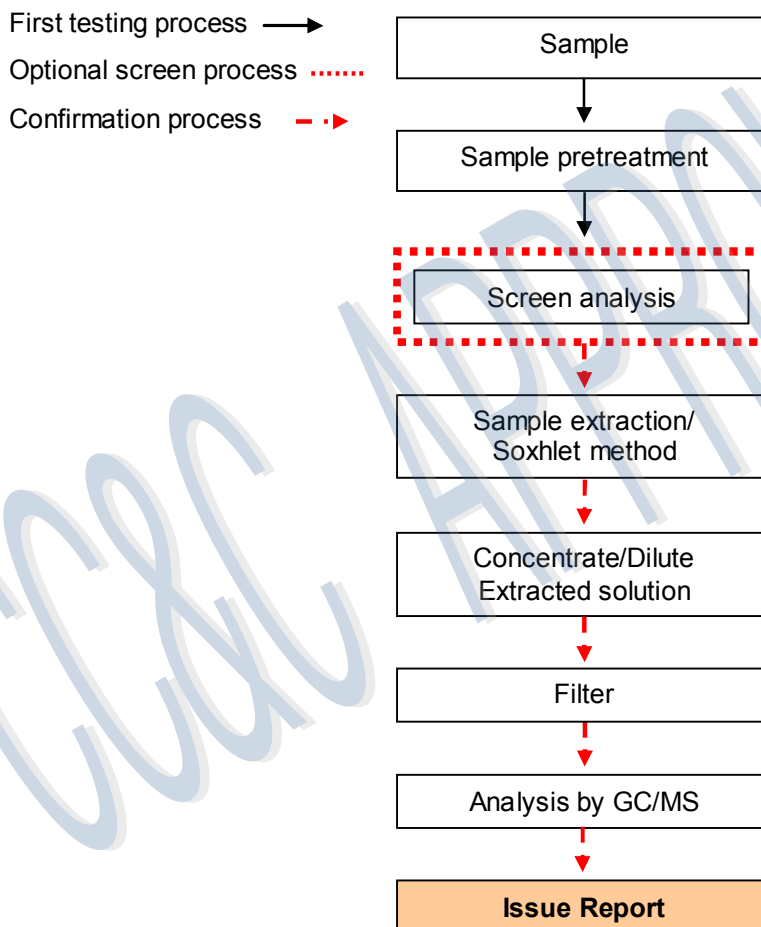
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ADVANCED CERAMIC X (ACX) CORPORATION
16, TZU CHIANG ROAD, HSINCHU INDUSTRIAL DISTRICT,
HSINCHU HSIEN, TAIWAN 303



PBB/PBDE analytical FLOW CHART

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



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** End of Report **

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