

承認書

PRODUCT APPROVAL SHEET

料號 : 205815G

PART NO

類別 : 非半導體-Antenna

CATEGORY

品名規格 : ANTENNA_AT8010-E2R9HAAT/LF_BT_Chip_MS842 BT

SPECIFICATION

廠牌廠商 : 盛鎰科技股份有限公司

MANUFACTURER

廠商料號 : AT8010-E2R9HAAT/LF

MANUFACTURER PART NO

確認日期 : 2018 年 08 月 14 日

DATE



確認部門: R&D 硬體審核: 沈冠穎 製表: 朱芷萱
DEPARTMENT EE APPROVED CREATED

AT8010 Series

Multilayer Chip Antenna

Features

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



Applications

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

Specifications

Part Number	Operating Frequency (MHz)	Peak Gain (dBi typ.)	Average Gain (dBi typ.)	VSWR	Impedance
AT8010-E2R9HAA	2400~2500	2.5 (XZ-V)	0.5 (XZ-V)	2 max.	50 Ω

Q'ty/Reel (pcs) : 1,000 pcs
 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 **8010** - **E** **2R9** **HAA** **□** **/LF**
 ① ② ③ ④ ⑤ ⑥ ⑦

① Type	AT : Antenna	② Dimensions (L × W)	8.0 × 1.0 mm
③ Material Code	E	④ Initial center frequency	2R9=2900MHz
⑤ Specification Code	HAA	⑥ Packaging	T: Tape & Reel B: Bulk
⑦ Soldering	/LF=lead-free		

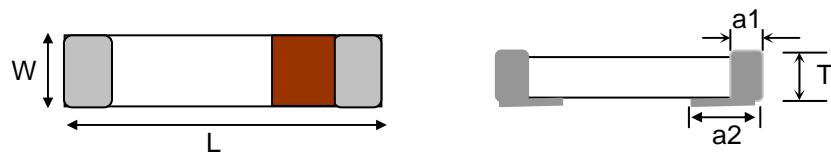
Terminal Configuration



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

Dimensions and Recommended PC Board Pattern

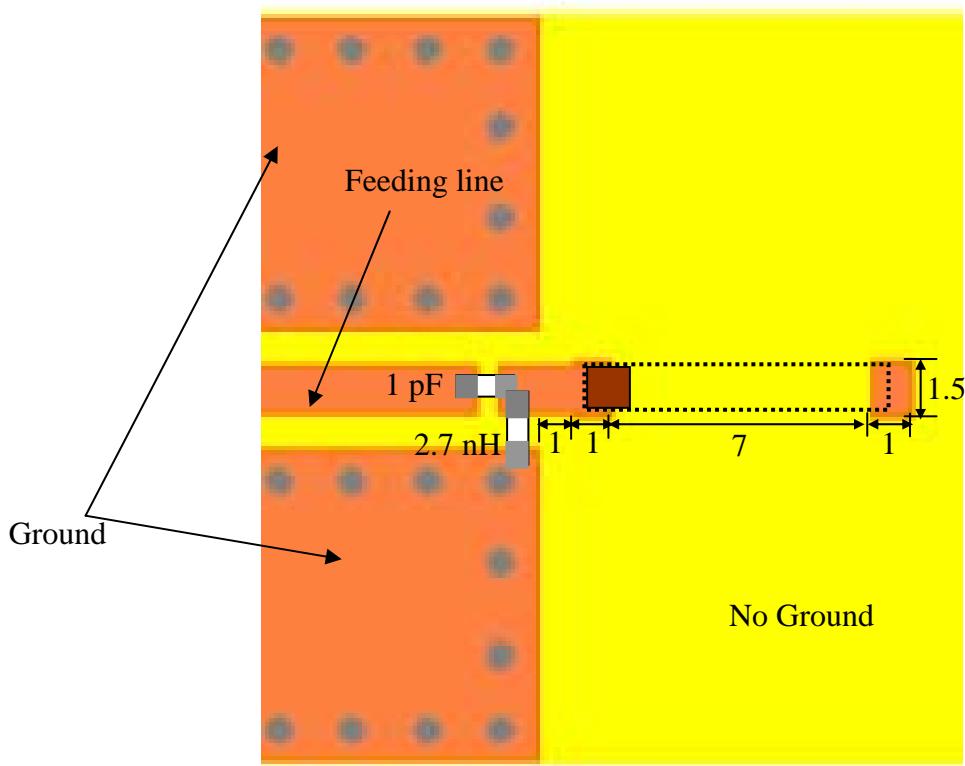
Unit : mm



Mark	L	W	T	a1	a2
Dimensions	8.0±0.2	1.0±0.2	1.0±0.2	0.5±0.2	1.0±0.2

The Recommended PC Board layout – Type A

❖ With Matching Circuits (Unit in mm)

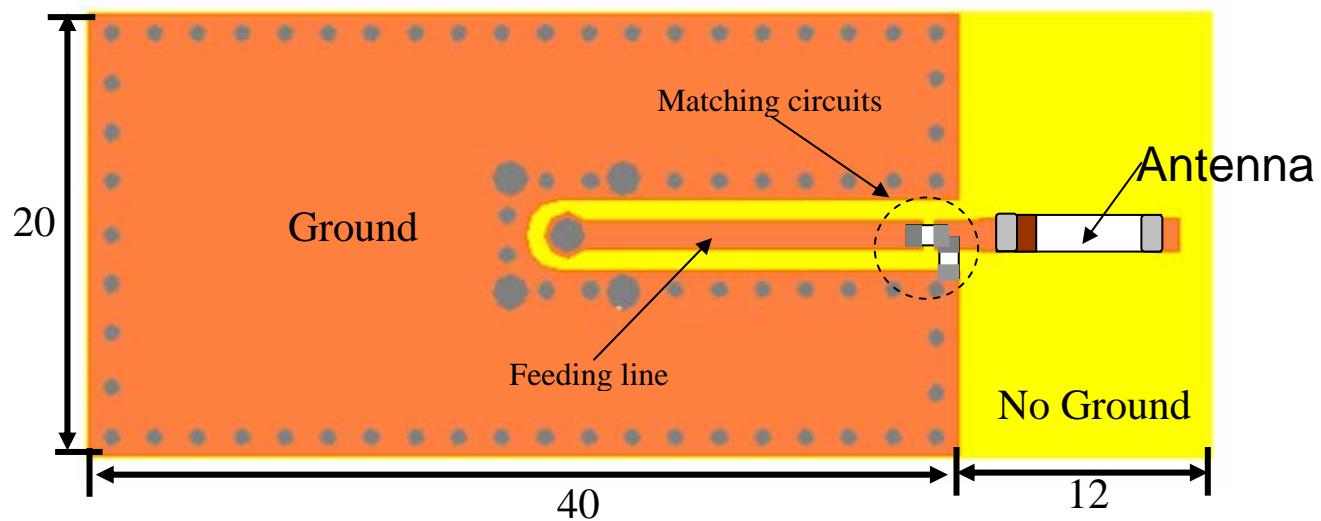


(Matching circuit and component values will be different, depending on PCB layout)

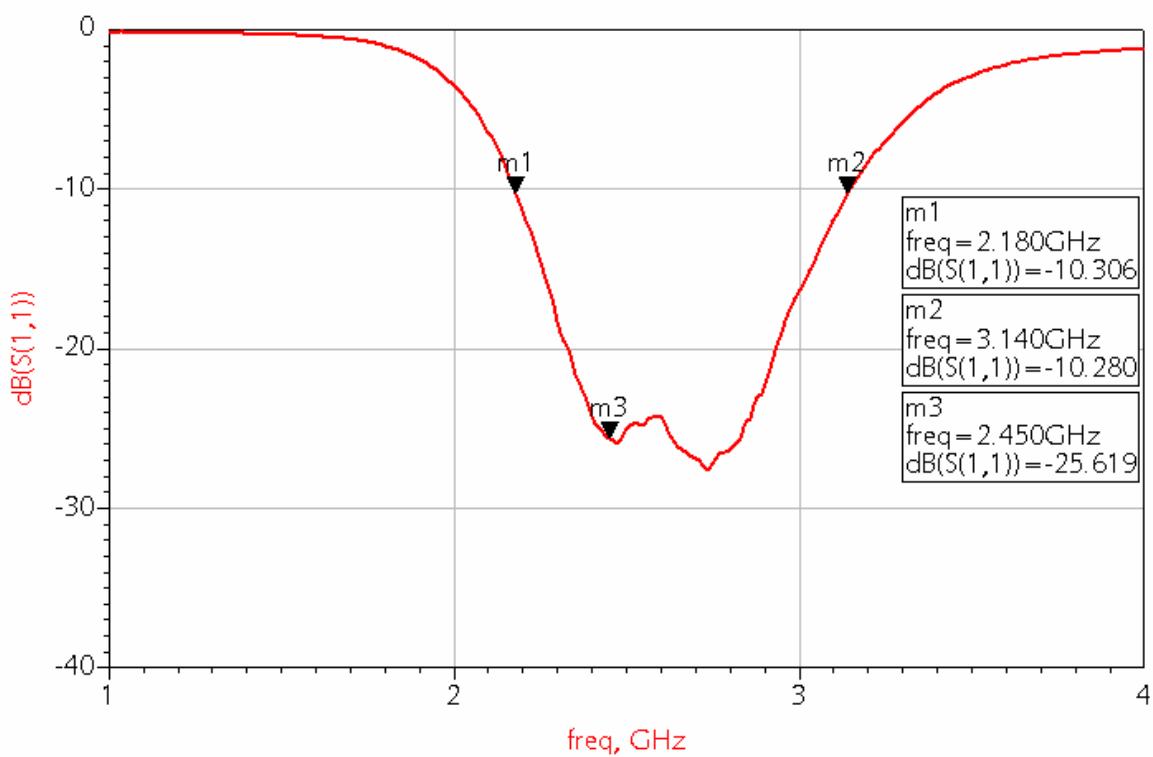
*Line width should be designed to match 50Ω characteristic impedance, depending on PCB material and thickness.

Typical Electrical Characteristics (T=25°C)

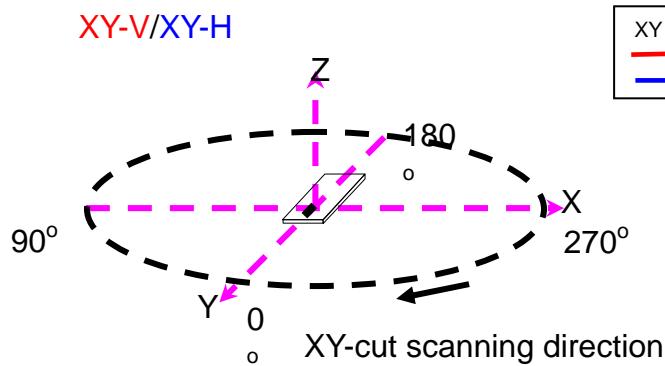
❖ Test Board – Type A (Unit in mm)



❖ Return Loss / With Matching Circuits

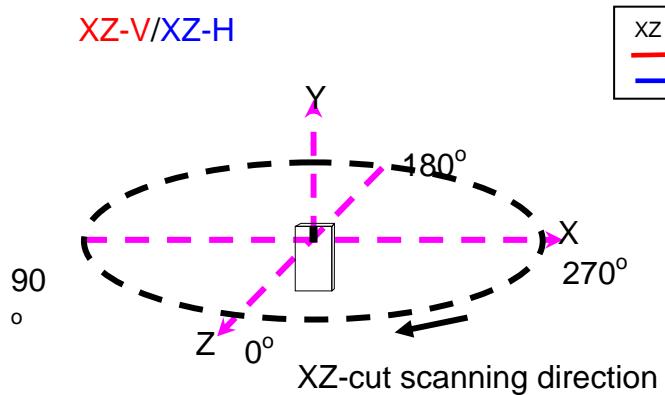
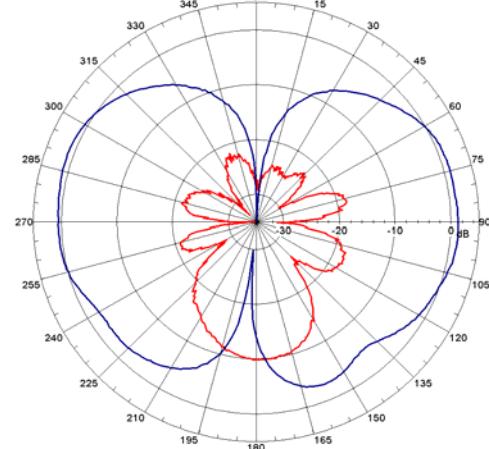


❖ Radiation Patterns



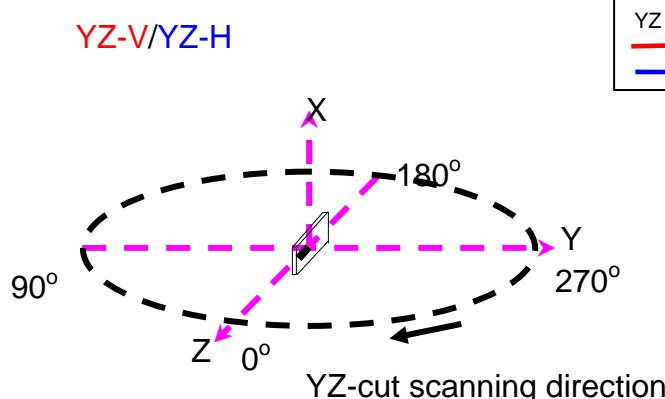
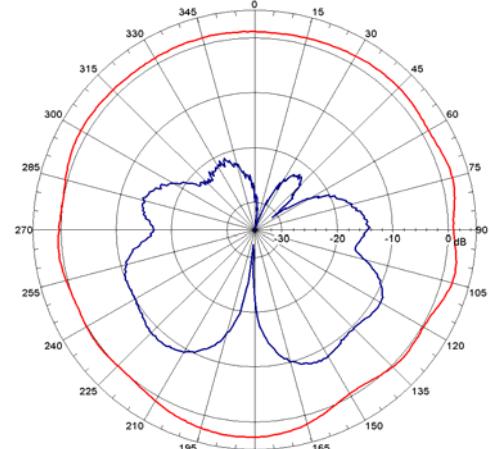
XY cut @2.45GHz

- Vertical
- Horizontal



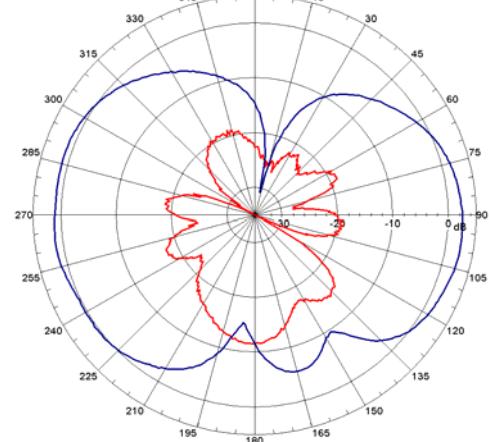
XZ cut @2.45GHz

- Vertical
- Horizontal



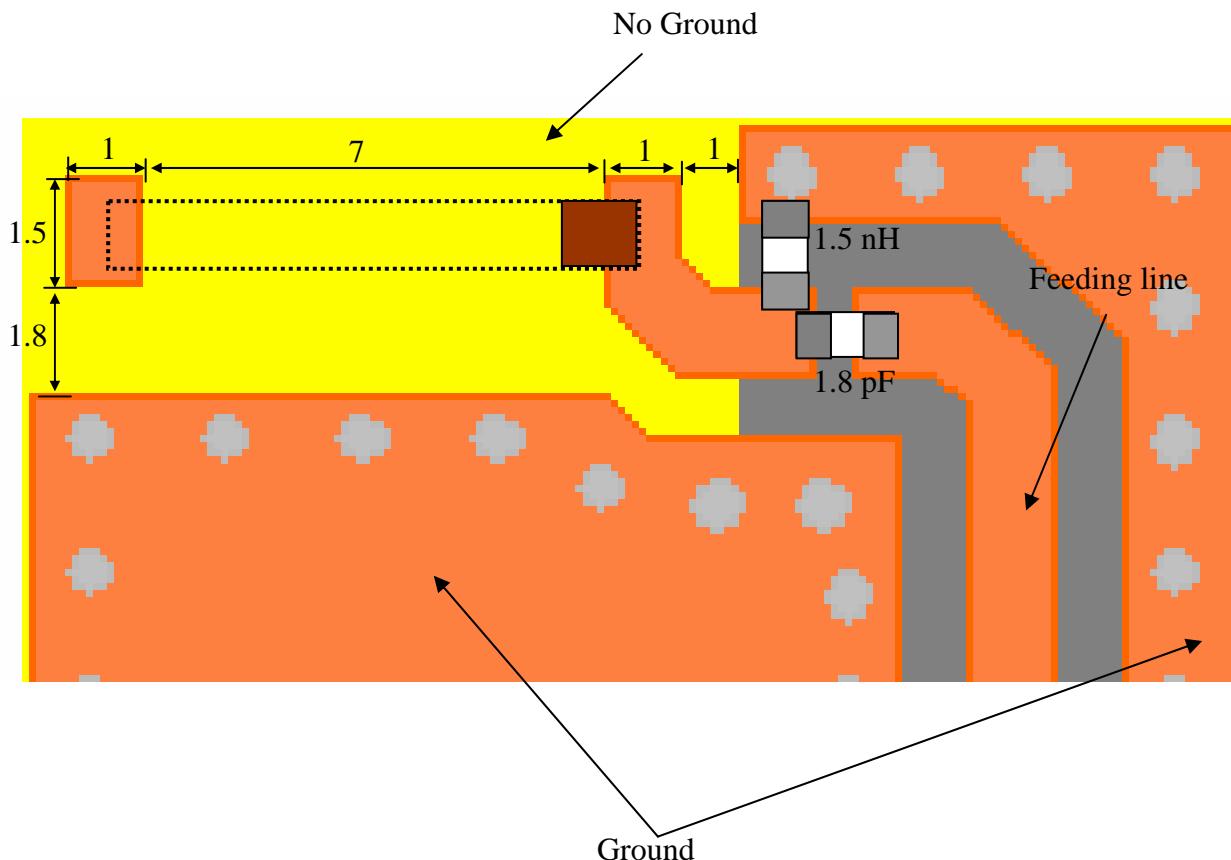
YZ cut @2.45GHz

- Vertical
- Horizontal



The Recommended PC Board layout – Type B

❖ With Matching Circuits (Unit in mm)

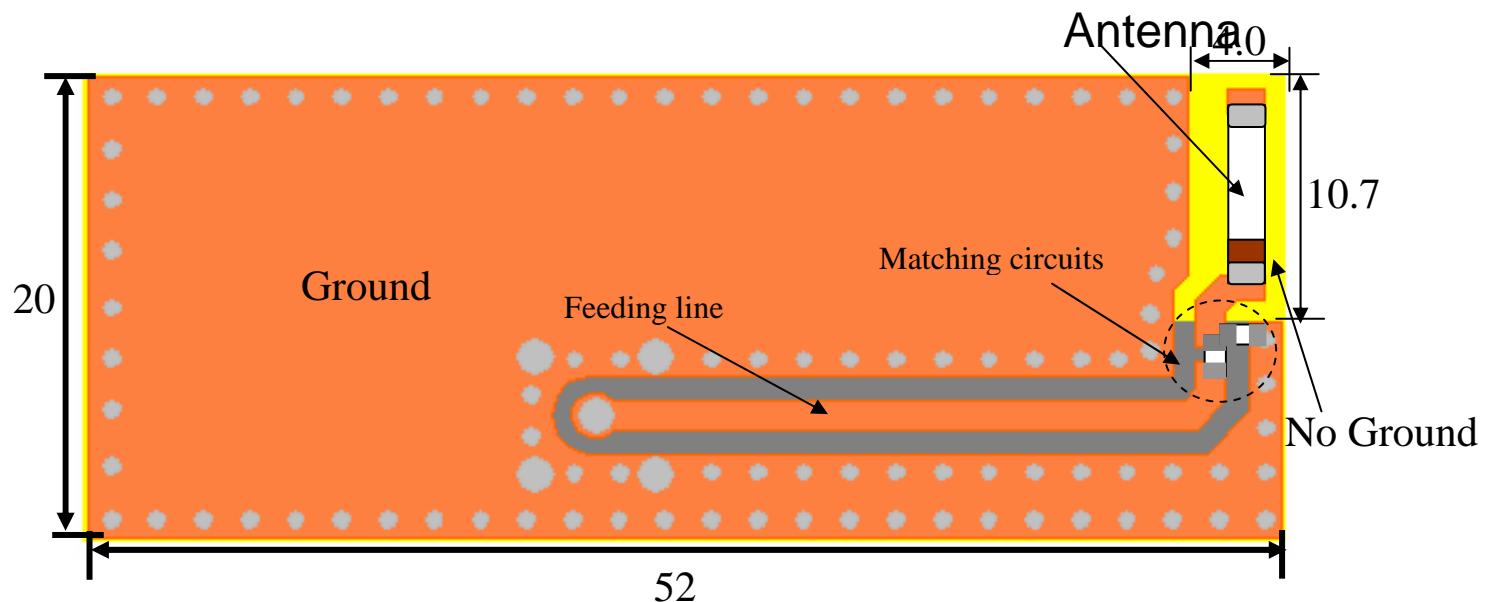


(Matching circuit and component values will be different, depending on PCB layout)

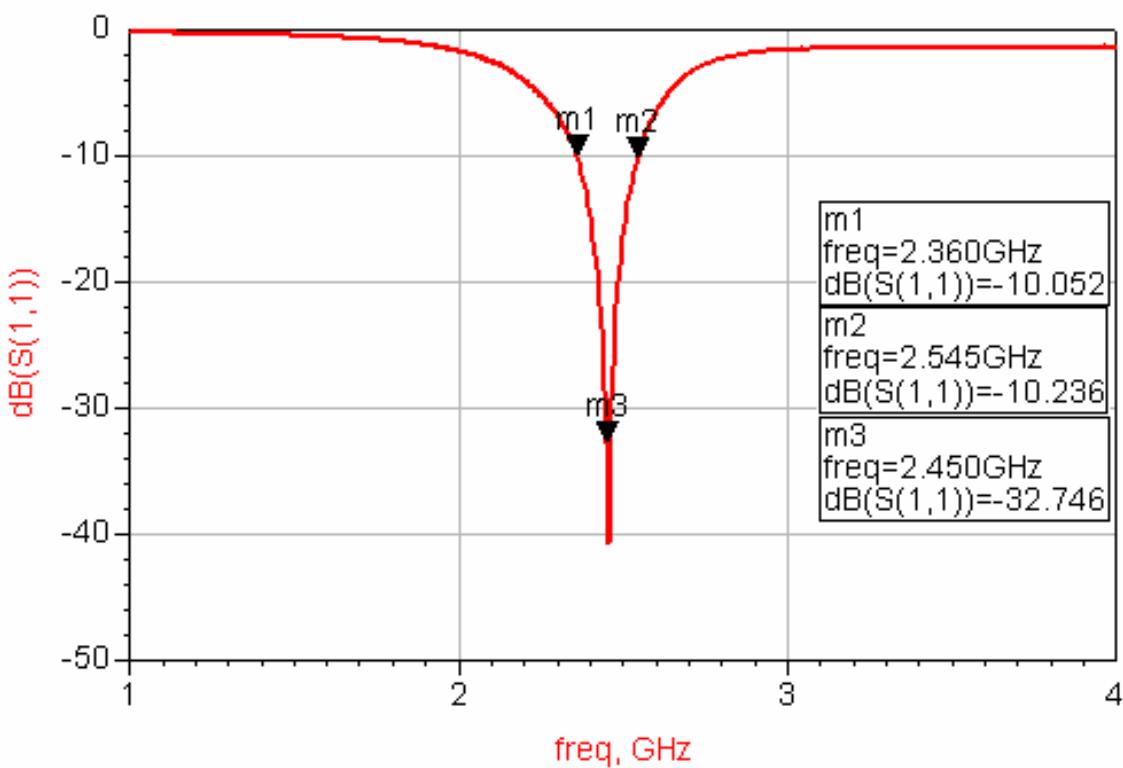
*Line width should be designed to match 50Ω characteristic impedance, depending on PCB material and thickness.

Typical Electrical Characteristics (T=25°C)

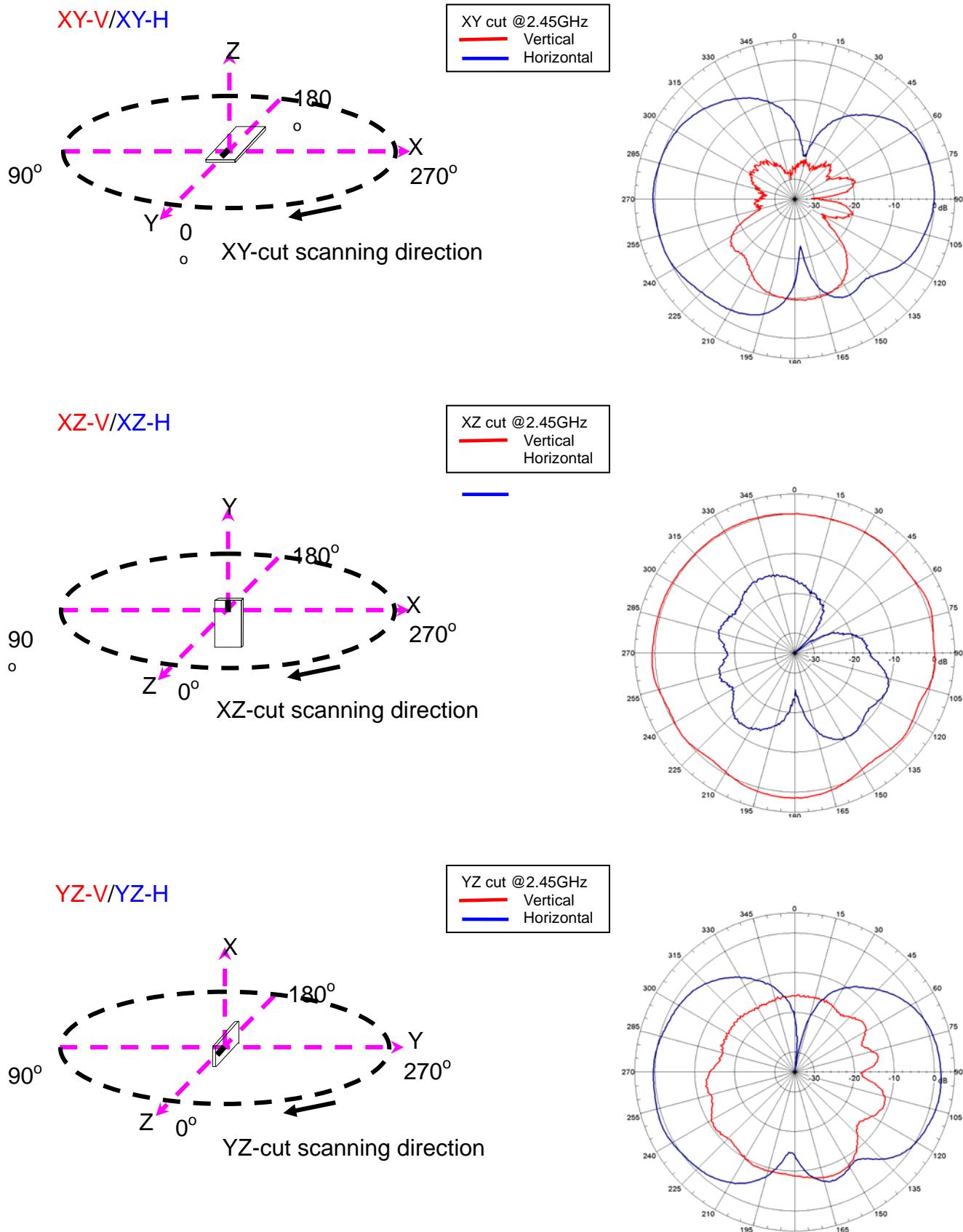
❖ Test Board – Type B (Unit in mm)



❖ Return Loss / With Matching Circuits

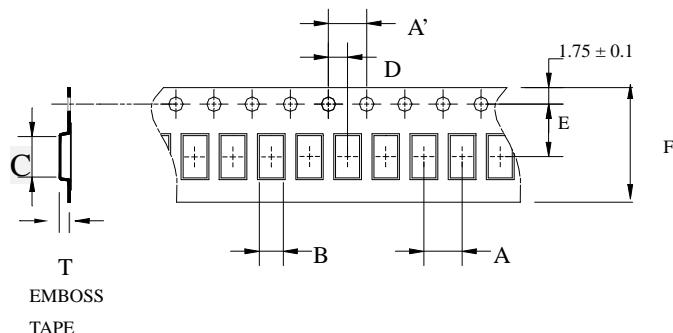


❖ Radiation Patterns



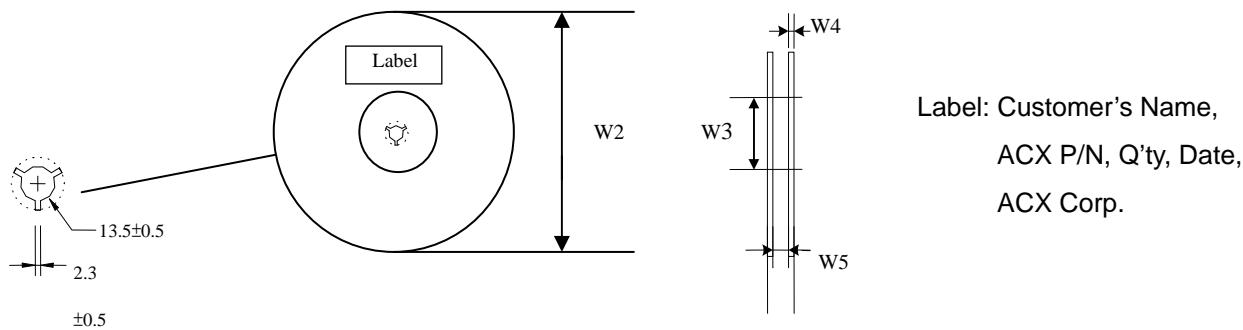
Taping Specifications

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



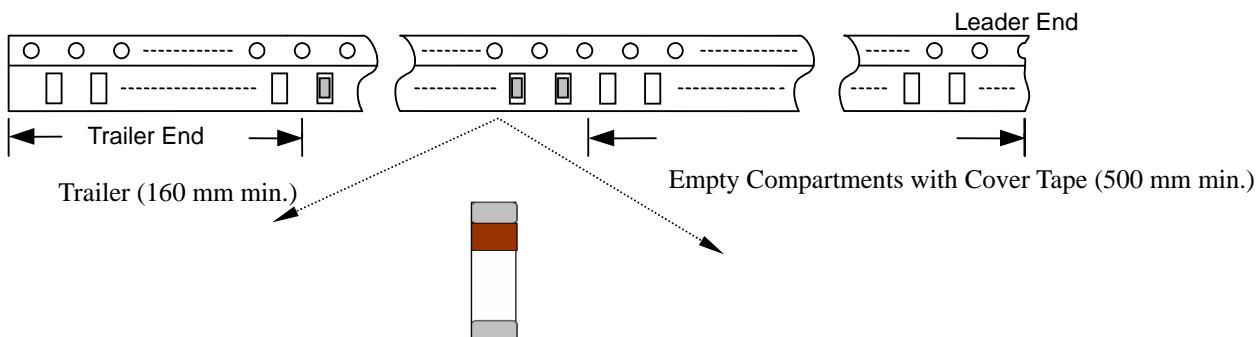
Type	A	A'	B	C	D	E	F	T	Quantity/per reel	Tape material
AT8010	4.0 ± 0.1	4.0 ± 0.1	1.3 ± 0.1	0.1	2.0 ± 0.05	0.1	16.0 ± 0.1	1.15 ± 0.1	1,000pcs	Plastic (Embossed)

❖ Reel Dimensions (Unit: mm)

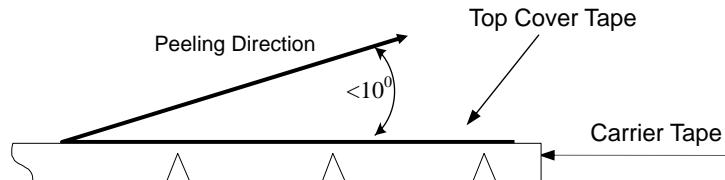


Type	W2	W3	W4	W5
AT8010	178 ± 1	60 ± 1	1.4 ± 0.2	17 ± 0.5

❖ Leader and Trailer Tape (Plastic material)



❖ **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 .

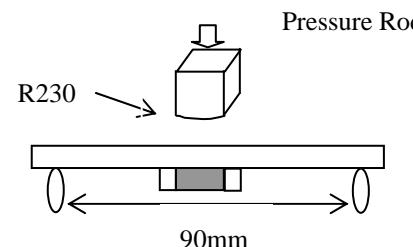
❖ **Storage Conditions**

- (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.

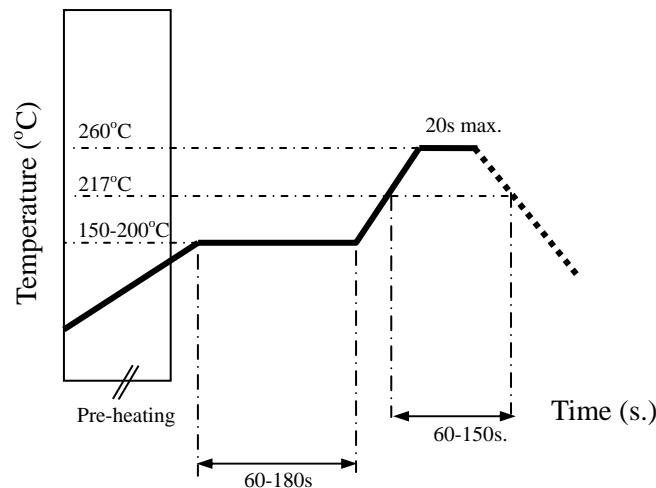
Mechanical & Environmental Characteristics

Item	Requirements	Procedure
Solderability	<ol style="list-style-type: none"> 1. No apparent damage 2. More than 95% of the terminal electrode shall be covered with new solder 	<ol style="list-style-type: none"> 1. Preheat: $120 \pm 5^\circ\text{C}$ 2. Solder: $245 \pm 5^\circ\text{C}$ for 5 ± 1 sec
Soldering strength (Termination Adhesion)	<ol style="list-style-type: none"> 1. 1kg minimum 	<ol style="list-style-type: none"> 1. Solder specimen onto test jig. 2. 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"> 1. No apparent damage 	<ol style="list-style-type: none"> 1. Solder specimen onto test jig (FR4, 0.8mm) using the recommend soldering profile. 2. Apply a bending force of 1 mm deflection. <div style="text-align: center;">  </div>
Heat/Humidity Resistance	<ol style="list-style-type: none"> 1. No apparent damage 2. Fulfill the electrical specification after test 	<ol style="list-style-type: none"> 1. Temperature: $85 \pm 2^\circ\text{C}$ 2. Humidity: 90% ~ 95% RH 3. Duration: 1000 ± 48 hrs 4. Recovery: 1-2 hrs
Thermal shock (Temperature Cycle)	<ol style="list-style-type: none"> 1. No apparent damage 2. Fulfill the electrical specification after test 	<ol style="list-style-type: none"> 1. One cycle/step 1 : $125 \pm 5^\circ\text{C}$ for 30 min step 2 : - $40 \pm 5^\circ\text{C}$ for 30 min 2. No of cycles : 100 3. Recovery: 1-2 hrs
Low Temperature Resistance	<ol style="list-style-type: none"> 1. No apparent damage 2. Fulfill the electrical specification after test 	<ol style="list-style-type: none"> 1. Temperature: $-40 \pm 5^\circ\text{C}$ 2. Duration: 500 ± 24 hrs 3. Recovery: 1-2 hrs

Soldering Conditions

❖ Typical Soldering Profile for Lead-free Process

Reflow Soldering :



Notes

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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

Applicant: Advanced Ceramic X Corporation
No. 16, Tzu Chiang Road,
Hsinchu Industrial District,
Hsinchu Hsien, Taiwan

Number : TWNC00655432

Date : Dec 08, 2017

Sample Description:

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

Sample Description : MULTILAYER LTCC-E COMPONENTS
Style / Item No. : AD SERIES, ADR SERIES, AF SERIES, AM SERIES, AT SERIES, ATR SERIES, AWR SERIES,
BD SERIES, BF SERIES, BL SERIES, BM SERIES, BW SERIES, CB SERIES, CD SERIES,
CF SERIES, CP SERIES, CM SERIES, CS SERIES, DB SERIES, DF SERIES, DM SERIES,
DP SERIES, DS SERIES, EF SERIES, ES SERIES, FA SERIES, FB SERIES, FD SERIES,
FM SERIES, FS SERIES, GS SERIES, HI SERIES, HF SERIES, HM SERIES, HS SERIES,
KS SERIES, MS SERIES, NS SERIES, LF SERIES, OM SERIES, OS SERIES, PA SERIES,
PD SERIES, PY SERIES, PZ SERIES, NF SERIES, QS SERIES, S SERIES, SF SERIES,
SFR SERIES, TS SERIES, TP SERIES, LTCC SUBSTRATES

Date Sample Received : Nov 30, 2017

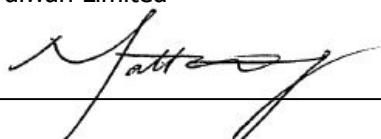
Date Test Started : Nov 30, 2017

Test Conducted:

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

Authorized by:

On Behalf of Intertek Testing Services
Taiwan Limited



Matt Wang
Sr. Manager



Test Conducted :

Test Result Summary:

Test Item	Unit	Test Method	<u>Result</u>	RL
			<u>White electronic component (mixed all parts)</u>	
Heavy Metal				
Cadmium (Cd) Content	ppm	With reference to IEC 62321-5: 2013, by microwave or acid digestion and determined by ICP-OES.	ND	2
Lead (Pb) Content	ppm	With reference to IEC 62321-5: 2013, by microwave or acid digestion and determined by ICP-OES.	ND	2
Mercury (Hg) Content	ppm	With reference to IEC 62321-4: 2013+AMD1: 2017, by microwave or acid digestion and determined by ICP-OES.	ND	2
Chromium VI (Cr ⁶⁺) Content	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.	ND	8
Polybrominated Biphenyls (PBBs)				
Monobrominated Biphenyls (MonoBB)	ppm	With reference to IEC 62321-6: 2015, by solvent extraction and determined by GC-MS and further HPLC-DAD confirmation when necessary.	ND	5
Dibrominated Biphenyls (DiBB)	ppm		ND	5
Tribrominated Biphenyls (TriBB)	ppm		ND	5
Tetrabrominated Biphenyls (TetraBB)	ppm		ND	5
Pentabrominated Biphenyls (PentaBB)	ppm		ND	5
Hexabrominated Biphenyls (HexaBB)	ppm		ND	5
Heptabrominated Biphenyls (HeptaBB)	ppm		ND	5
Octabrominated Biphenyls (OctaBB)	ppm		ND	5
Nonabrominated Biphenyls (NonaBB)	ppm		ND	5
Decabrominated Biphenyl (DecaBB)	ppm		ND	5



Test Conducted :

Test Item	Unit	Test Method	<u>Result</u>	RL
			<u>White electronic component (mixed all parts)</u>	
Polybrominated Diphenyl Ethers (PBDEs)				
Monobrominated Diphenyl Ethers (MonoBDE)	ppm	With reference to IEC 62321-6: 2015, by solvent extraction and determined by GC-MS and further HPLC-DAD confirmation when necessary.	ND	5
Dibrominated Diphenyl Ethers (DiBDE)	ppm		ND	5
Tribrominated Diphenyl Ethers (TriBDE)	ppm		ND	5
Tetrabrominated Diphenyl Ethers (TetraBDE)	ppm		ND	5
Pentabrominated Diphenyl Ethers (PentaBDE)	ppm		ND	5
Hexabrominated Diphenyl Ethers (HexaBDE)	ppm		ND	5
Heptabrominated Diphenyl Ethers (HeptaBDE)	ppm		ND	5
Octabrominated Diphenyl Ethers (OctaBDE)	ppm		ND	5
Nonabrominated Diphenyl Ethers (NonaBDE)	ppm		ND	5
Decabrominated Diphenyl Ether (DecaBDE)	ppm		ND	5
Phthalates				
Di(2-ethylhexyl) Phthalate (DEHP)	ppm	With reference to IEC 62321-8:2017, by solvent extraction and determined by GC-MS.	ND	50
Dibutyl Phthalate (DBP)	ppm		ND	50
Benzyl Butyl Phthalate (BBP)	ppm		ND	50
Diisobutyl Phthalate (DIBP)	ppm		ND	50
Halogen Content				
Fluorine (F)	ppm	With reference to EN 14582:2016 by combustion bomb with oxygen and determined by Ion Chromatography.	ND	50
Chlorine (Cl)	ppm		ND	50
Bromine (Br)	ppm		ND	50
Iodine (I)	ppm		ND	50

Remarks: ppm = Parts per million based on weight of tested sample = mg/kg

ND = Not detected

RL = Reporting limit, quantitation limit of analyte in sample

Responsibility of Chemist: Pelny Hsiao/ Vita Fu

Date Sample Received : Nov 30, 2017

Test Period : Nov 30, 2017 to Dec 06, 2017



Test Conducted :

RoHS Limit

<u>Restricted Substances</u>	<u>Limits</u>
Cadmium (Cd) content	0.01% (100ppm)
Lead (Pb) content	0.1% (1000ppm)
Mercury (Hg) content	0.1% (1000ppm)
Chromium VI (Cr ⁶⁺) content	0.1% (1000ppm)
Polybrominated Biphenyls (PBBs)	0.1% (1000ppm)
Polybrominated Diphenyl Ethers (PBDEs)	0.1% (1000ppm)
Di(2-ethylhexyl) Phthalate (DEHP)	0.1% (1000ppm)
Dibutyl Phthalate (DBP)	0.1% (1000ppm)
Benzyl Butyl Phthalate (BBP)	0.1% (1000ppm)
Diisobutyl Phthalate (DIBP)	0.1% (1000ppm)

The limits were quoted from Annex II of 2011/65/EU and Amendment (EU) 2015/863 for homogeneous material.



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Test Conducted :

Measurement Flowchart:

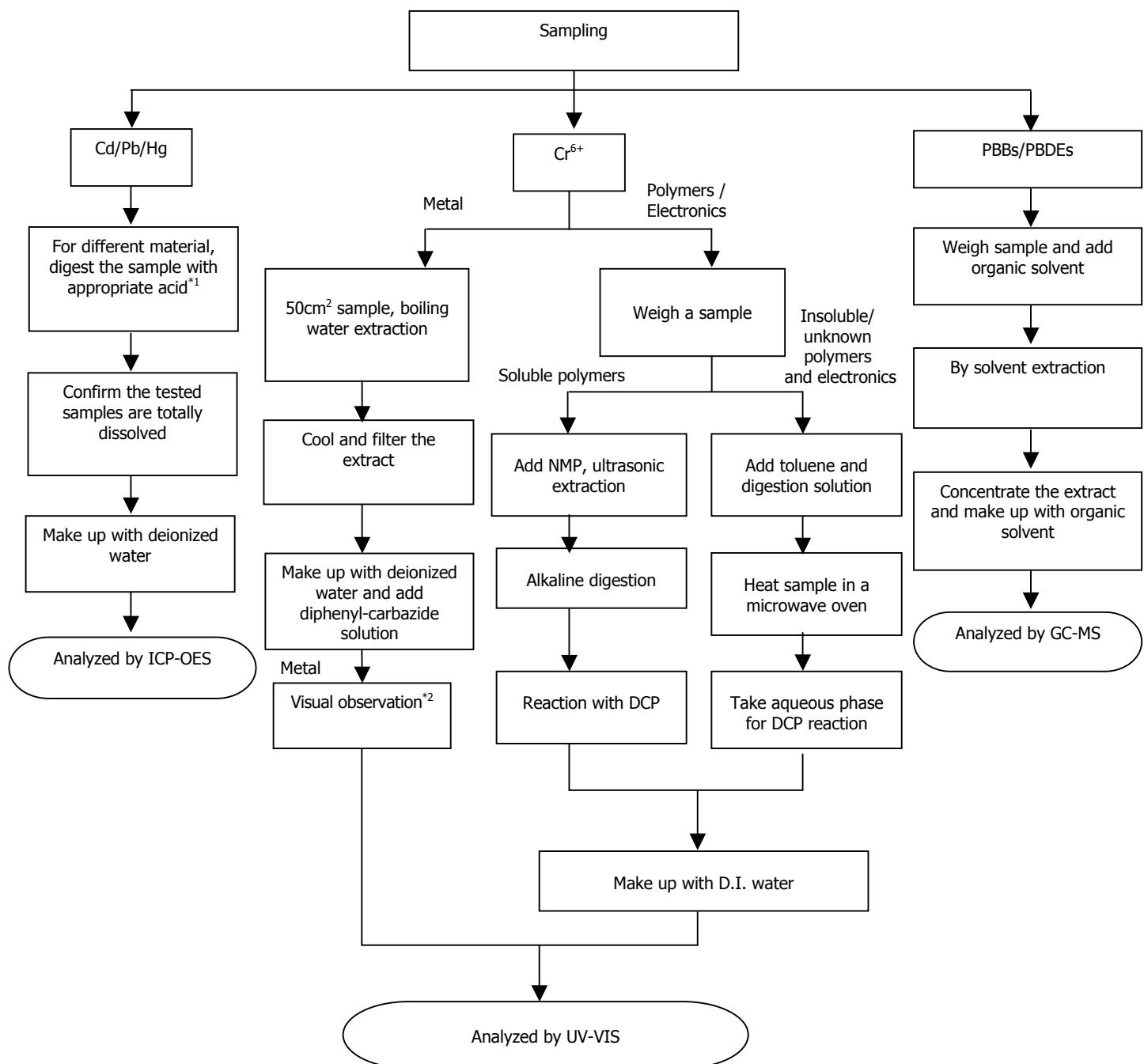
Test for Cd/Pb/Hg/Chromium (VI)/PBBs/PBDEs Content

Reference Standard : Cd/Pb: IEC 62321-5:2013; Hg: IEC 62321-4:2013+AMD1:2017;

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 :

Remarks:

*1: List of Appropriate Acid :

Material	Acid Added for Digestion
Polymers	HNO ₃ ,HCl,HF,H ₂ O ₂ ,H ₃ BO ₃
Metals	HNO ₃ ,HCl,HF
Electronics	HNO ₃ ,HCl,H ₂ O ₂ ,HBF ₄

*2: If sample solution is significantly more intense than 0.13 $\mu\text{g}/\text{cm}^2$ equivalent comparison standard, Chromium VI would be determined as detected, the result of visual observation is positive.

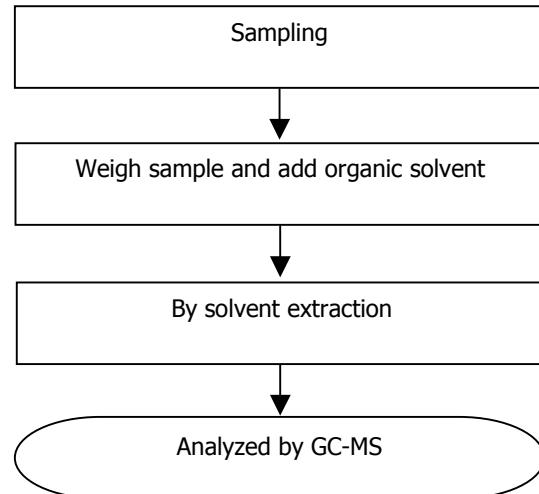


Test Conducted :

Measurement Flowchart:

Test for Phthalates Content

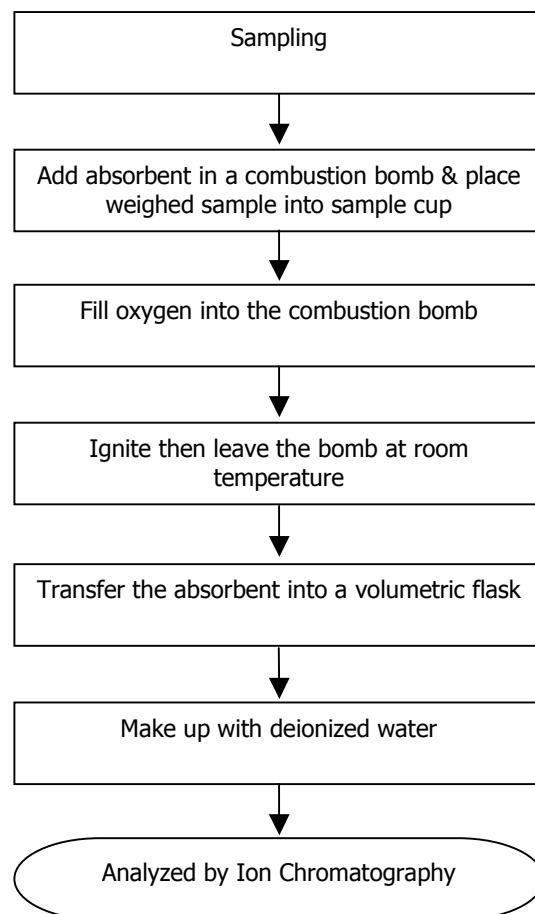
Reference Method: IEC 62321-8:2017



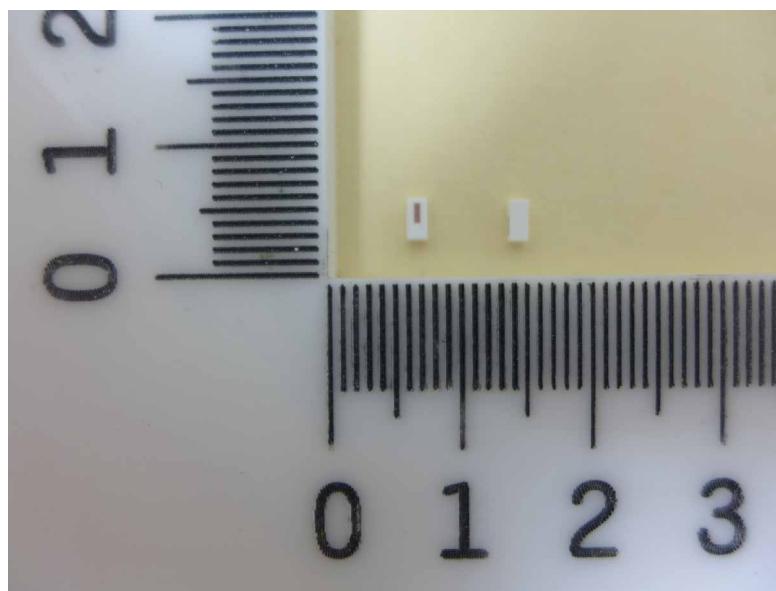
Test Conducted :

Measurement Flowchart:

Test for Halogen Content
Reference Method: EN 14582



Number : TWNC00655432



End of Report

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