承 認 書

APPROVAL SHEET

客 戶 名 稱 Customer	麗臺科技股份有限公司
原 製 造 廠 Manufacturer	Johanson
物 料 品 名 Description	2450 MHz Small SMD chip Antenna
原 廠 編 碼 Part No.	2450AT42B100
承 認 編 號 Cert. No.	JO-C02-15072701-ANT

製作日期 Issue Date	更新內容 Change Log	承製人員 Made by
07-27-2015	初版	Emily

利 安 科 技 股 份 有 限 公 司
BENTECH COMPUTER CORP.
新北市汐止區康寧街 169 巷 23 號 7 樓之 1
7F.-1, No.23, Ln. 169, Kangning St., Xizhi Dist.
New Taipei City 22180, Taiwan (R.O.C.)
TEL：02-2695-8906 FAX：02-2695-8911

"High Frequency Ceramic Solutions"

2450 MHz Small SMD Chip Antenna — P/N 2450AT42B100

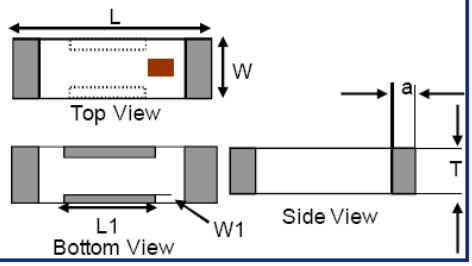
Ground Clearance Requirements Minimized. This antenna was designed for corner or end-mounting

Detail Specification: 10/08/13

General Specifications			
Part Number	2450AT42B100		
Frequency Range	2400 - 2500 Mhz		
Peak Gain	0 dBi typ. (XZ-V)		
Average Gain	-1.5 dBi typ. (XZ-V)		
Return Loss	9.5 dB min.		
Impedance	50 Ω		
Reel Quanity	2,000		
Operating Temperature	-40 to +85°C	**Storage Period**	-40 to +85°C
Recommended Storage Conditio	+5 ~ +35 °C,Humidity 45~75%RH	**Power Capacity**	2W max. (CW)

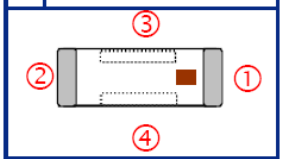
Mechanical Dimensions

	In	mm
L	0.197 ± 0.008	5.00 ± 0.20
W	0.079 ± 0.008	2.00 ± 0.20
L1	0.102 ± 0.008	2.60 ± 0.20
W1	0.020 ± 0.008	0.50 ± 0.20
T	0.079 +.004/-.008	2.00 +0.1/-0.2
a	0.020 ± 0.012	0.50 ± 0.30



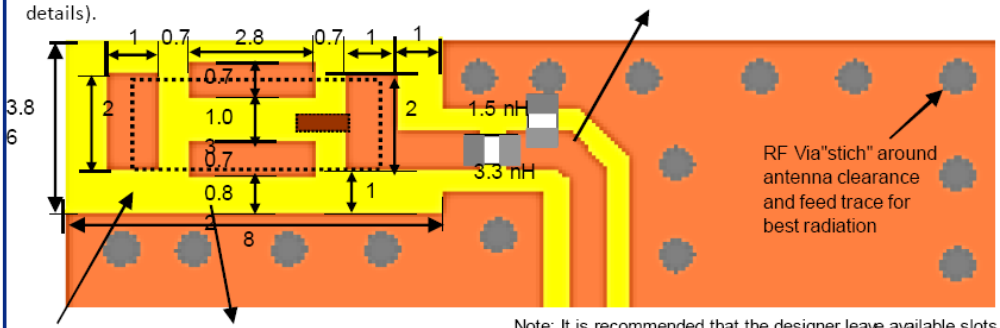
Terminal Configuration

No.	Function
1	Feeding Point
2	NC
3	NC
4	NC



Mounting Considerations

Line width should be designed to match 50Ω characteristic impedance (Grounded Co-Planar Waveguide), depending on PCB material and thickness. (The matching circuit and component values will be different on clients PCB layout, se notes below and go to page 2 for details).



We peform layout review as well as antenna tuning and characterization services. Go to page 2 for details.

Yellow area=Ground/Metal Clearance.

The "0.82mm" dimmension is a min. requirement, if the designer can make this larger, the better radiation and gain will occur (i.e. 2.0 or 4.0mm)

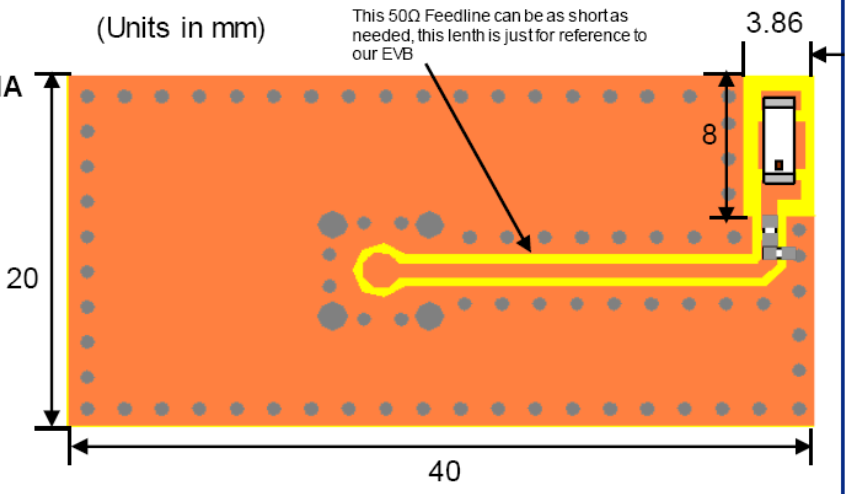
Note: It is recommended that the designer leave available slots for a "pi" (or shunt-series-shunt) network. The antenna matching network values here are used when antenna is mounted on Johanson's evaluation board. The matching values on clinet's PCB will be different, go to: johansontechnology.com/tuning and see how to obtain the new values. If you need further help, contact our RF Applications Eng Team at: www.johansontechnology.com/en/ask-a-technical-question.html

JOHANSON TECHNOLOGY
www.johansontechnology.com
4001 Calle Tecate • Camarillo, CA 93012 • TEL 805.389.1166 FAX 805.389.1821

Johanson Evaluation Board (orderable item)

Test Board:
P/N: 2450AT42B100-EB1SMA
(orderable item)

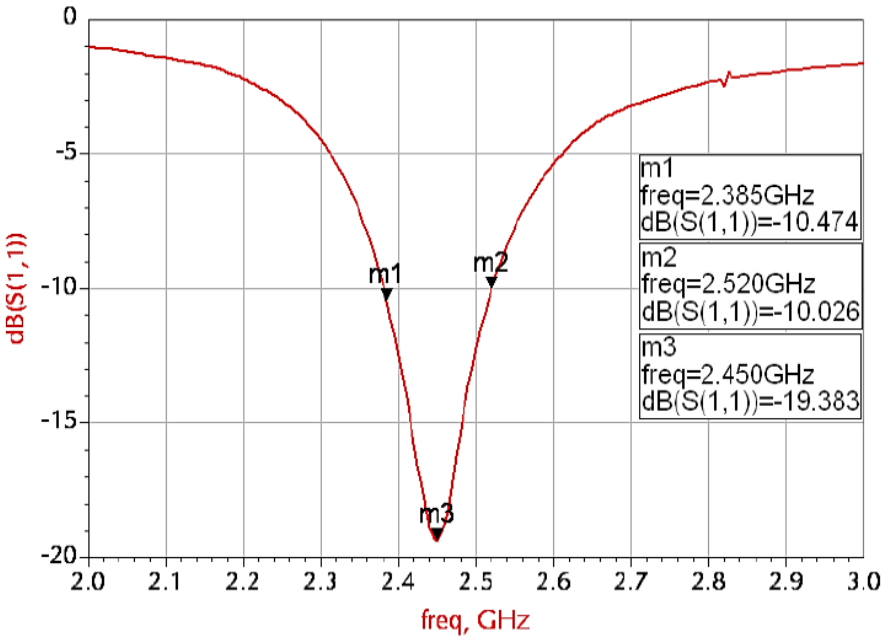
To order, go to:
www.johansontechnology.com/samplerequest



We offer antenna layout review, tuning, and characterization services, go to:
www.johansontechnology.com/ipcantennaservices for details and instructions

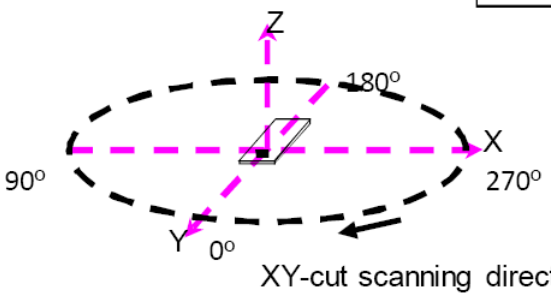
Typical Electrical Characteristics (T=25°C)

Return Loss (with matching)

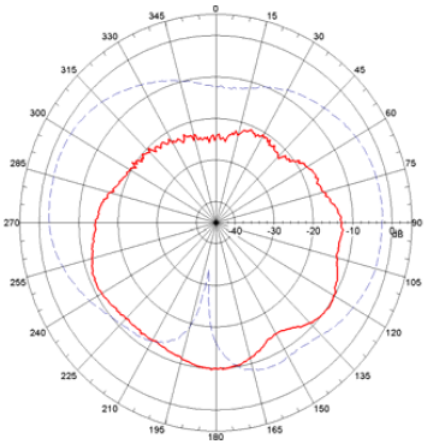


Typical Electrical Characteristics (T=25°C) Radiation Patterns

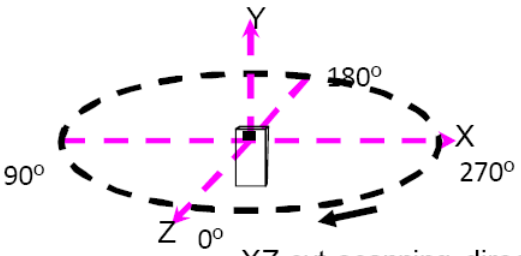
XY-V/XY-H



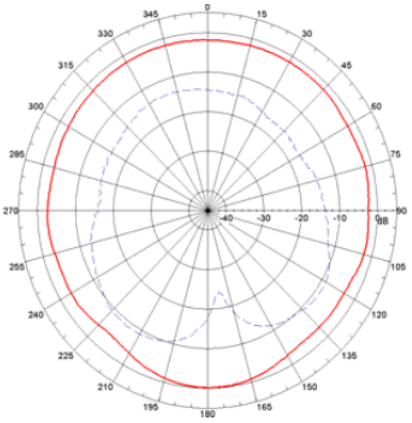
XY-cut scanning direction



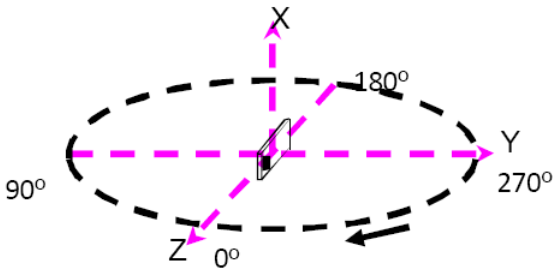
XZ-V/XZ-H



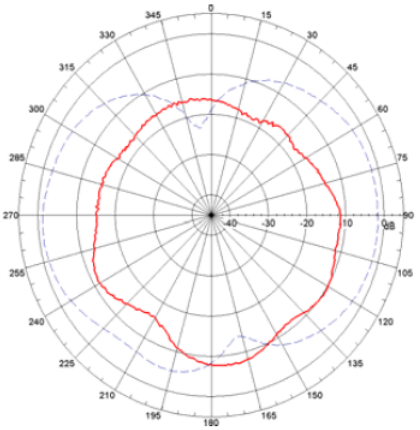
XZ-cut scanning direction



YZ-V/YZ-H



YZ-cut scanning direction



2450 MHz Small SMD Chip Antenna **P/N 2450AT42B100**

Detail Specification: 10/08/13

Part Number Explanation				
P/N Suffix	Packing Style	Bulk (loose pieces)	Suffix = S	eg.2450AT42B100S
		T & R	Suffix = E	eg. 2450AT42B100E
		T & R (Reverse)	Suffix = R	eg. 2450AT42B100R (MOQ Applies)
		100% Tin	Suffix = None	eg. 2450AT42B100(S, E, R)
	Eval Board (1-port SMA antenna test boards)	2450AT42B100-EB1SMA (Page 2)		
	More Details	www.johansontechnology.com/ipc-pn-explained		

Storage Conditions and Shelf Life (On T&R or Bulk)			
Temperature:	+5C to +35°C	**Shelf Life:**	18 months max.
Relative Humidity:	45 to 75%		

Packaging information
www.johansontechnology.com/ipcpackaging.html

Soldering Information
www.johansontechnology.com/ipcsoldering-profile

Antenna layout and tuning techniques
www.johansontechnology.com/tuning

Antenna layout review, tuning, and characterization services
www.johansontechnology.com/ipcantennaservices

RoHS Compliance
www.johansontechnology.com/technical-notes/rohs-compliance.html

MSL Info
www.johansontechnology.com/technical-notes/msl-rating.html

JOHANSON TECHNOLOGY

www.johansontechnology.com
4001 Calle Tecate • Camarillo, CA 93012 • TEL 805.389.1166 FAX 805.389.1821

Conflict Minerals Investigation

衝 突 礦 產 調 查

Materials or Products which supply to Leadtek contains any of 4 minerals as below. (gold，tin，tantalum，tungsten)

在提供給麗臺科技的零件或產品中所含物質含有以下這四項物質<金、錫、鉭、鎢>

☒YES ■NO

IF YES，please complete the following<A&B>

若選擇 **YES**，請完成下列 **A** 及 **B**。

(A) Select the mineral which contained, and check these boxes. (Multiple Choice Possible)

若選擇YES，請選擇所含有的物質在下列表格中<可複選>

Gold<金>	☒YES
Tin<錫>	☒YES
Tantalum<鉭>	☐YES
Tungsten<鎢>	☒YES

(B)If contains any of 4 minerals, please complete to fill in additional form as below.

若含有四項任何物質，請完成下列冶煉廠清單

Product Name 產品/零件名稱	mineral contained 所含物質	Metals originate from the DRC or an adjoining country 來源來自剛果或相鄰國家	Smelter Names 冶煉廠名稱	Smelter Facility Contact Name 冶煉廠聯絡人	Smelter Facility Contact Email 冶煉廠郵件信箱	Smelter Facility Location Address 冶煉廠地址	Country 所在國家
	Gold	☒YES ☐ NO	Royal Canadian Mint	Chris Carkner	ccarkner@mint.ca	320 Sussex Drive Ottawa, Ontario	CANADA
	Gold	☒YES ☐ NO	Metalor USA Refining Corporation	Larry Drummond	larrydrummond@metalor.com	255 John Dietsch Dr. Attleboro Falls, Massachusetts	USA
	Gold	☒YES ☐ NO	Umicore SA Business Unit Precious Metals Refining	Jean Poole	jean.poole@am.umicore.com	Adolf Greinerstraat 14, B-2660 Hoboken Antwerp, Belgium	BELGIUM
	Gold	☒YES ☐ NO	United Precious Metal Refining, Inc.	Bill Merkle	sales@unitedpmr.com	271 Town Line Road Alden, New York	USA
	Tin	☒YES ☐ NO	Minsur	Bernard Silverstein	bsilverstein@acmtin.com	AV. San Martin 1371 Pisco, Peru	PERU
	Tungsten	☒YES ☐ NO	H.C. Starck GmbH	Frank Habig	frank.habig@hcstark.com	Im Schleecke 78-91 Gostar, Germany	GERMANY

Test Report

No. : CE/2014/72919 Date : 2014/07/17 Page : 1 of 8

JOHANSON TECHNOLOGY INCORPORATED
4001 CALLE TECATE, CAMARILLO, CA 93012 USA

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

Sample Submitted By	:	JOHANSON TECHNOLOGY INCORPORATED
Sample Description	:	INTEGRATED PASSIVE COMPONENTS
Style/Item No.	:	INTEGRATED PASSIVE COMPONENTS INCLUDING "AD", "AM", "AS", "AT", "BD", "BL", "BM", "BP", "CD", "CF", "CH", "CP", "DP", "FA", "FB", "HP", "LD", "LP", "PD", AND"NF"
Sample Receiving Date	:	2014/07/15
Testing Period	:	2014/07/15 TO 2014/07/17

==========

Test Requested : (1) As specified by client, to test Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs contents in the submitted sample.

(2) As specified by client, to test PFOA, PFOS, 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).

SGS TAIWAN LTD

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

JOHANSON TECHNOLOGY INCORPORATED
4001 CALLE TECATE, CAMARILLO, CA 93012 USA

Test Result(s)

PART NAME No.1 : MIXED ALL PARTS

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	32
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.
Perfluorooctane sulfonates (PFOS-Acid, Metal Salt, Amide)	mg/kg	With reference to US EPA 3550C: 2007. Analysis was performed by LC/MS.	10	n.d.
PFOA (CAS No.: 335-67-1)	mg/kg	With reference to US EPA 3550C: 2007. Analysis was performed by LC/MS.	10	n.d.
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.

JOHANSON TECHNOLOGY INCORPORATED
4001 CALLE TECATE, CAMARILLO, CA 93012 USA

Test Item(s)	Unit	Method	MDL	Result
				No.1
Sum of PBBs	mg/kg	With reference to IEC 62321: 2008 and performed by GC/MS.	-	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.

Note :

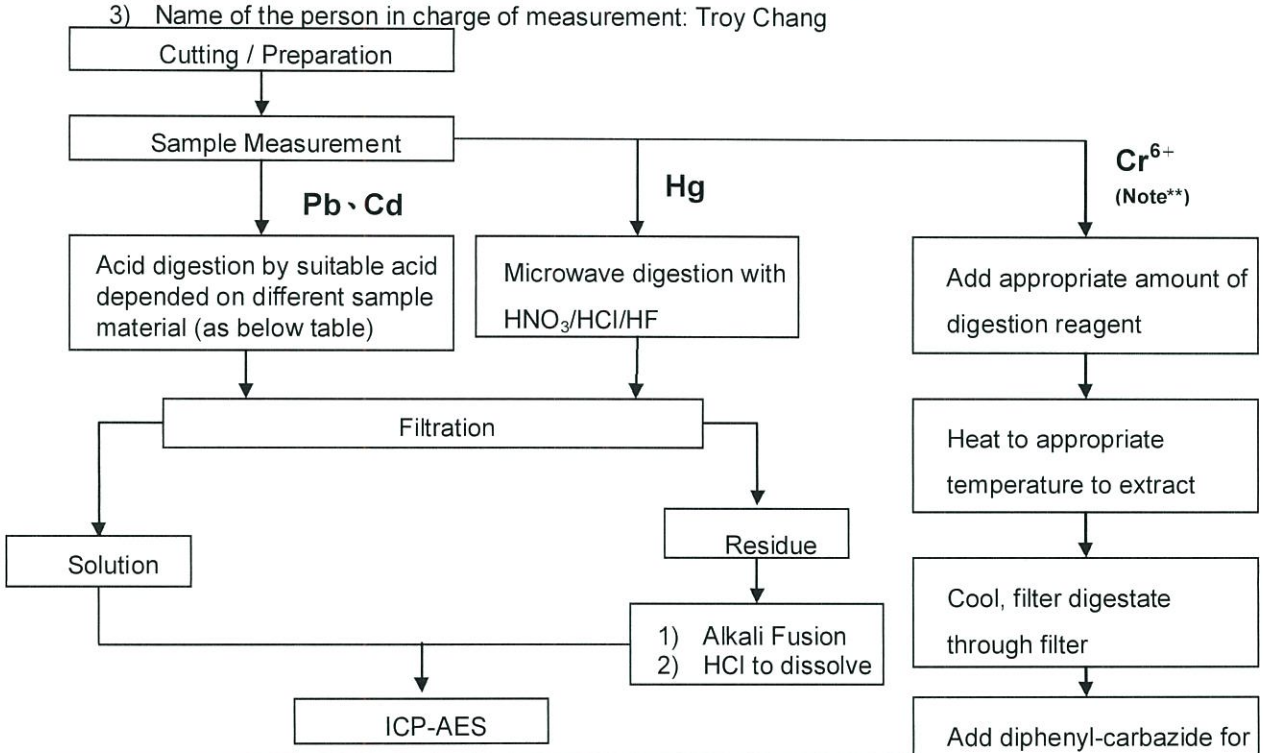
1. mg/kg = ppm; 0.1wt% = 1000ppm
2. n.d. = Not Detected
3. MDL = Method Detection Limit
4. " - " = Not Regulated
5. The sample(s) was/were analyzed on behalf of the applicant as mixing sample in one testing. The above result(s) was/were only given as the informality value.

PFOS Reference Information : POPs - (EU) 757/2010

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.

JOHANSON TECHNOLOGY INCORPORATED
4001 CALLE TECATE, CAMARILLO, CA 93012 USA

1) These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr^{6+} test method excluded)
2) Name of the person who made measurement: Climbgreat Yang
3) Name of the person in charge of measurement: Troy Chang



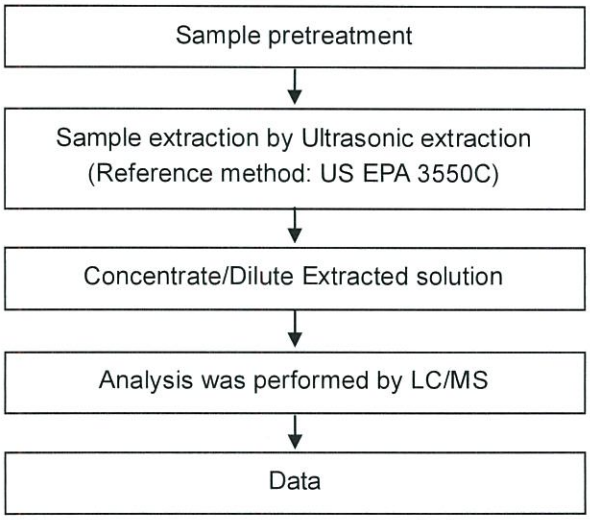
Sample Material	Digestion Acid
Steel, copper, aluminum, solder	Aqua regia, HNO_3, HCl, HF, H_2O_2
Glass	HNO_3/HF
Gold, platinum, palladium, ceramic	Aqua regia
Silver	HNO_3
Plastic	H_2SO_4, H_2O_2, HNO_3, HCl
Others	Added appropriate reagent to total digestion

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

JOHANSON TECHNOLOGY INCORPORATED
4001 CALLE TECATE, CAMARILLO, CA 93012 USA

PFOA/PFOS analytical flow chart of Ultrasonic extraction (LC/MS) procedure

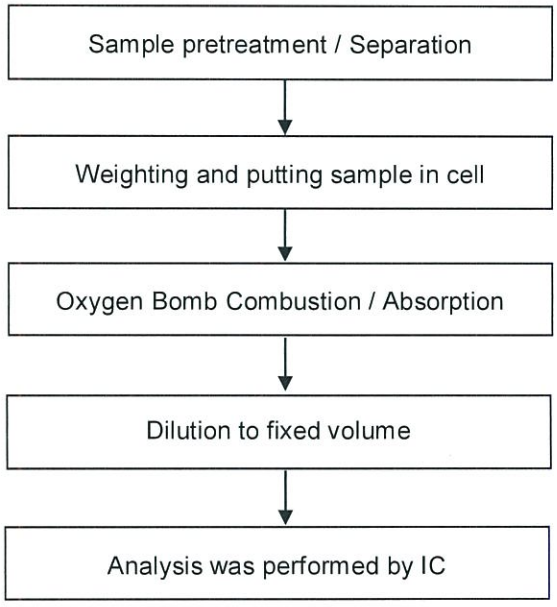
- Name of the person who made measurement: Roman Wong
- Name of the person in charge of measurement: Troy Chang



JOHANSON TECHNOLOGY INCORPORATED
4001 CALLE TECATE, CAMARILLO, CA 93012 USA

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

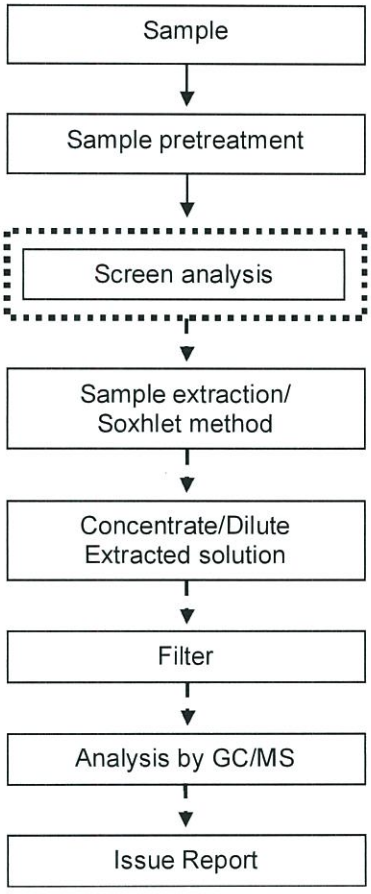


JOHANSON TECHNOLOGY INCORPORATED
4001 CALLE TECATE, CAMARILLO, CA 93012 USA

PBB/PBDE analytical FLOW CHART

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

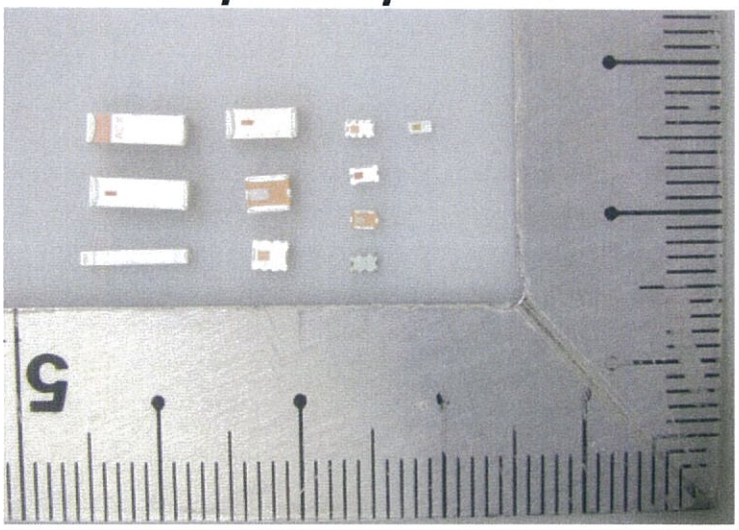
First testing process →
Optional screen process ▪▪▪▪
Confirmation process – ·▸



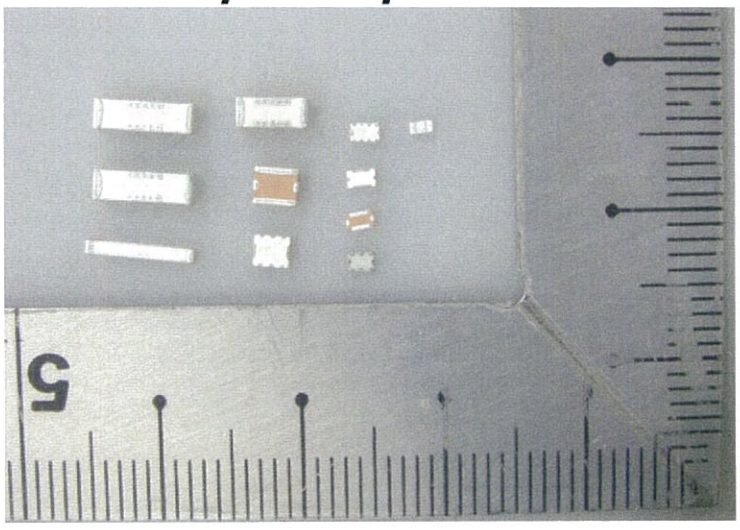
JOHANSON TECHNOLOGY INCORPORATED
4001 CALLE TECATE, CAMARILLO, CA 93012 USA

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

CE/2014/72919



CE/2014/72919



** End of Report **