環天世通科技股份有限公司
GLOBALSAT WORLDCOM CORPORATION

文件編號:

A-102-257

APPROVAL SHEET

規 格 承 認 書

Description
品名：Multilayer Chip Antenna 3.2x1.6x1.3mm , P/N:AT3216-B2R7HAA , ACX

Part No
料號： N0ACAT32160000

Date
日期： 06 / 10, 2013

Brand /Vender
製造(代理)商： 盛鎰科技股份有限公司

Original Part No.
原 廠 編 號 ：

Remark
備註：

供應商依本承認書規格交貨，檢驗規格不符時全數退回。
如有規格變更時請檢附檢試報告，並送樣重新核定。

核 准	審 核	承 辦	品 保	發 行 章
蔡政輝 10/2 2013	10/3/2013	Peter 6/10	鄧慧慈 10/4/2013	環天世通科技 2013.10.08 AUTHORIZED 發 行

GlobalSat WorldCom Corporation
台北縣 235 中和市建一路 186 號 16 樓(遠東世紀廣場 H 棟)
16F., NO.186, Jian Yi Road , 235 Chung Ho City,Taipei Hsien, Taiwan ,R.O.C.
Tel: 886-2-8226-3799 (Rep.) Fax: 886-2-8226-3899
Web:www.globalsat.com.tw E-mail:service@globalsat.com.tw

盛微科技股份有限公司 Anttech Electronics Corp.

SPECIFICATION

(RoHS Compliant & Halogen Free)

APPROVAL SHEET

Date: 2013/06/07

Customer： 環天世通科技股份有限公司

ANTTECH P/N： AT3216-B2R7HAAT/LF

Description： Chip Antennas 3216/2.4~2.5GHz

Customer P/N：

Model name：

Contact person： 許 敬 揚 Jeff Hsu

Contact TEL： 886-2-2950-0366#311／0936-942-396

Attachment：

■ SPECIFICATION

Engineer	Q.A. Dept.	Approved

ACX
Advanced Ceramic X

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

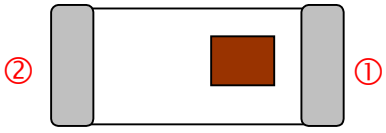
Q'ty/Reel (pcs) : 3,000pcs
Operating Temperature Range : -40 ~ +85 °C
Storage Temperature Range : -40 ~ +85 °C
Power Capacity : 3W max.

Part Number

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

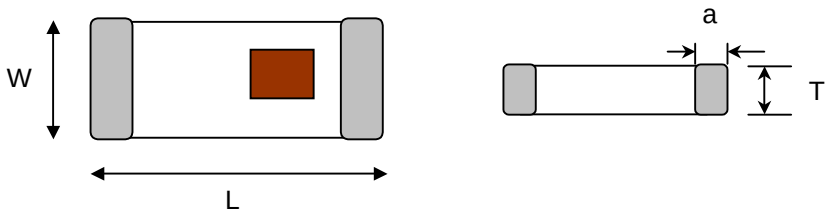
Terminal Configuration



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

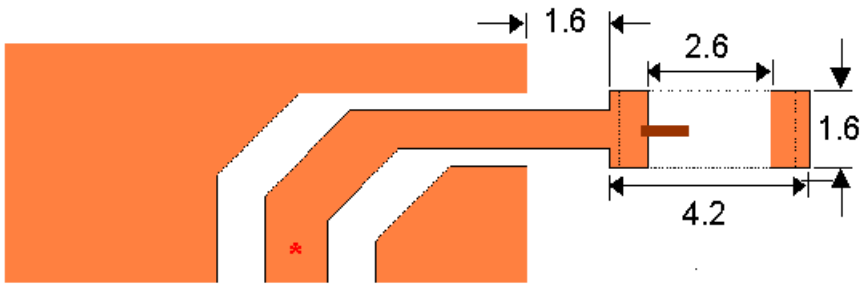
Dimensions and Recommended PC Board Pattern

Unit : mm

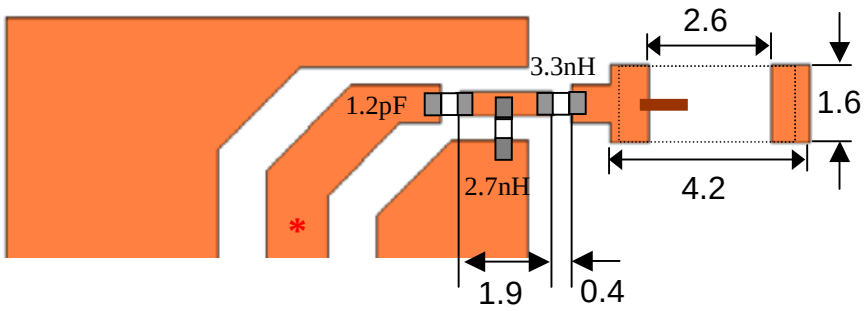


Mark	L	W	T	a
Dimensions	3.2±0.2	1.6±0.2	1.3+ 0.1/-0.2	0.5±0.3

(a) Without Matching Circuits



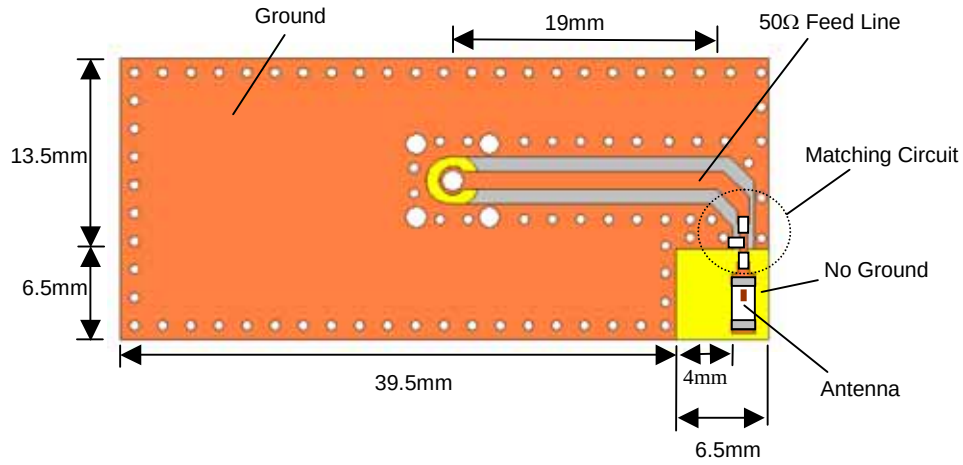
(b) With Matching Circuits



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

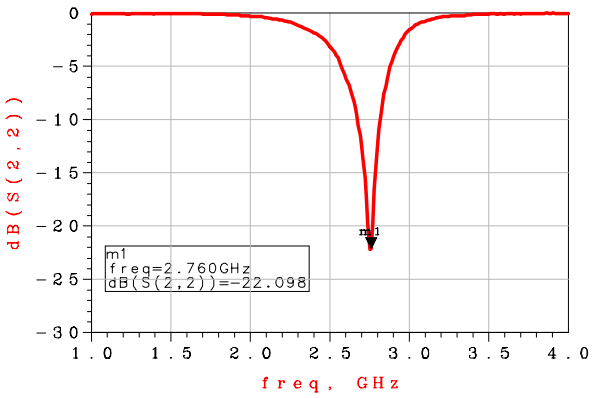
Typical Electrical Characteristics (T=25°C)

❖Test Board

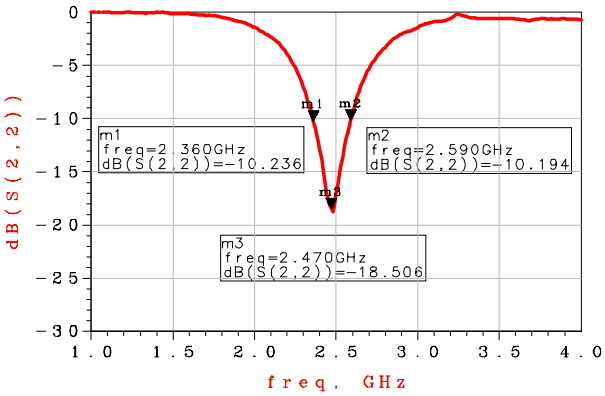


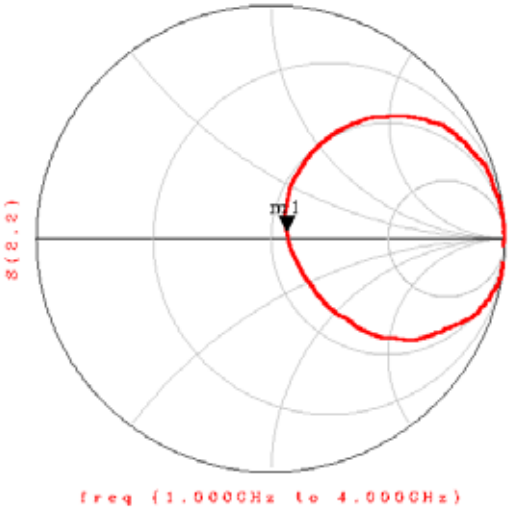
❖Return Loss

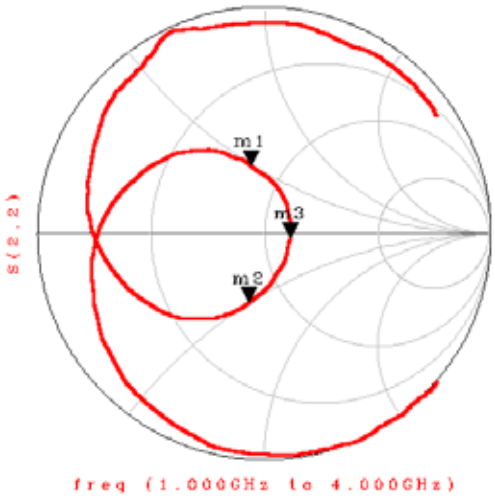
(a) Without Matching Circuits



(b) With Matching Circuits

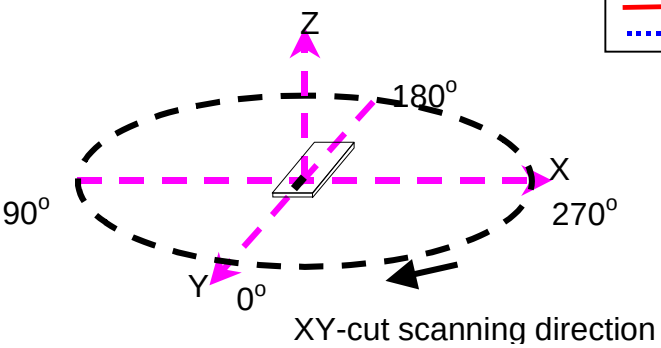




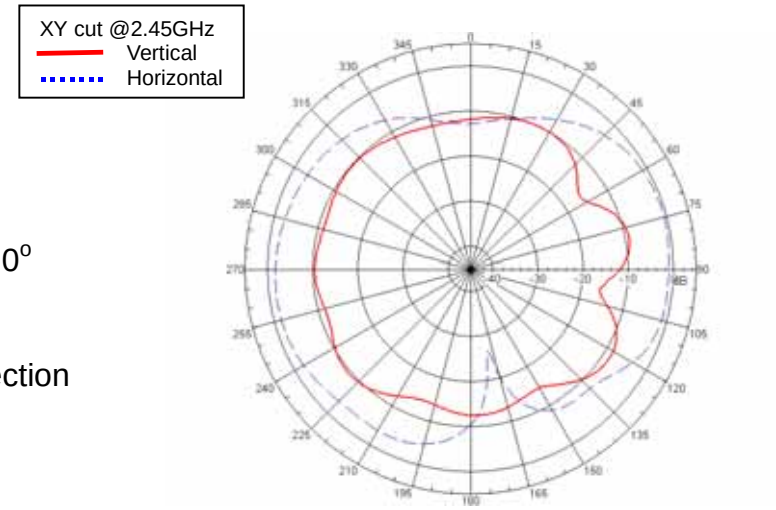


Radiation Patterns

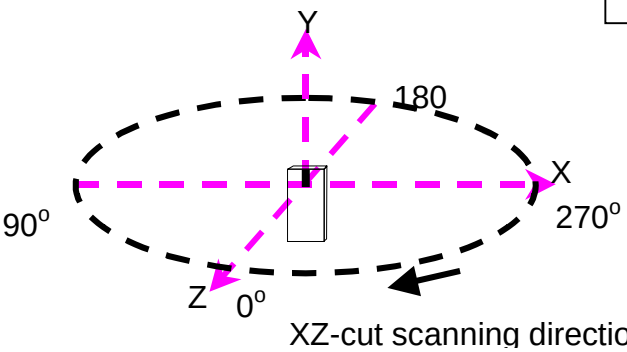
XY-V/XY-H



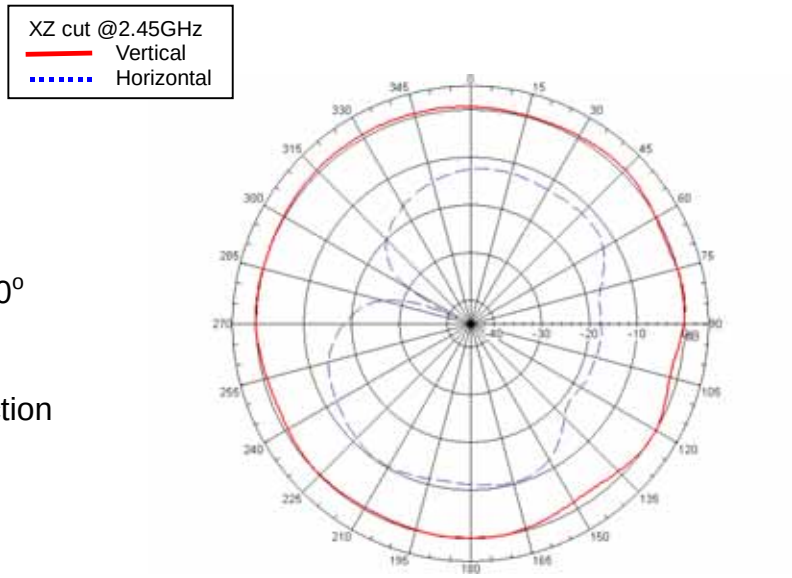
XY-cut scanning direction



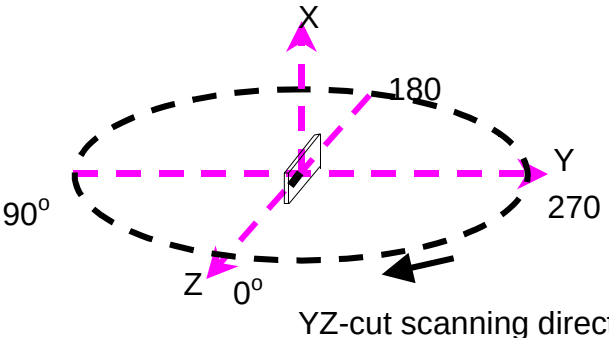
XZ-V/XZ-H



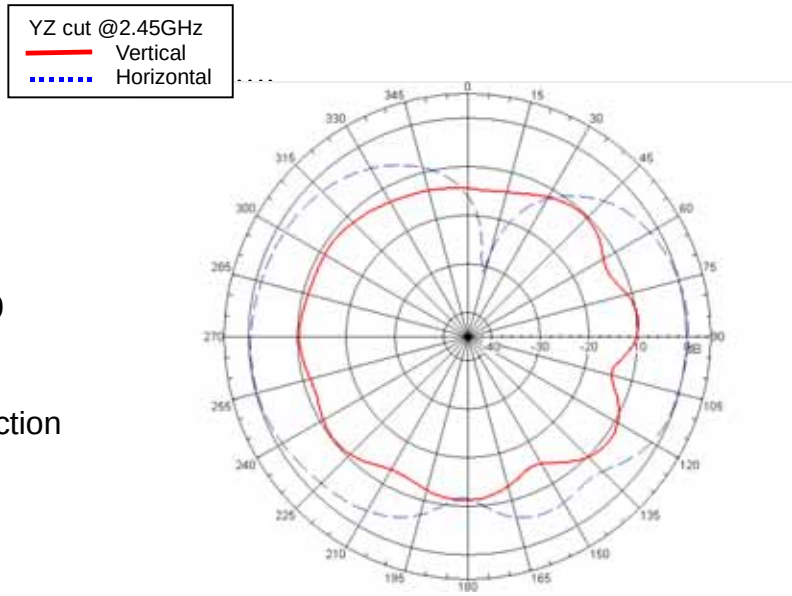
XZ-cut scanning direction



YZ-V/YZ-H



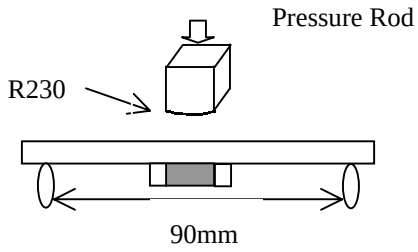
YZ-cut scanning direction



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

ACX
Advanced Ceramic X

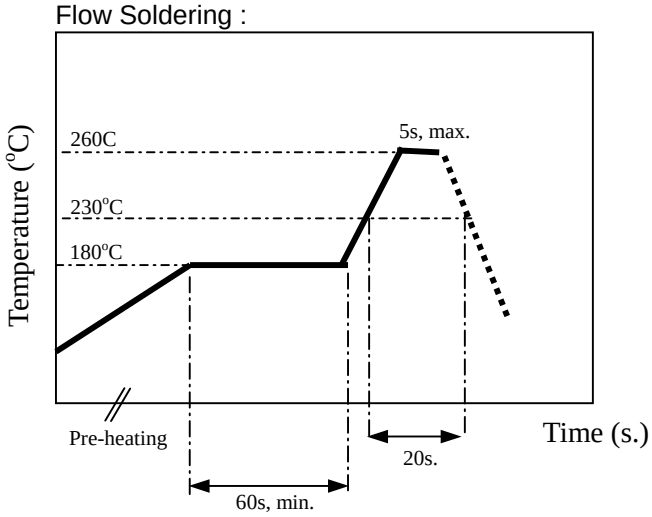
Mechanical & Environmental Characteristics

	Requirements	Procedure
Solderability	1. No apparent damage 2. More than 75% of the terminal electrode shall be covered with new solder	1. Preheat: 120± 5 °C 2. Solder: 230± 5°C for 5± 1 sec
Thermal shock (Temperature Cycle)	1. No apparent damage 2. Fulfill the electrical specification after test	1. One cycle/ step 1: 85 ± 5 °C for 20sec step 2: -40 ± 3 °C for 20sec 2. Cycle time: 30min 3. No. of cycles: 100 4. Recovery: 1-2hrs
Heat Resistance	1. No apparent damage 2. Fulfill the electrical specification after test	1. Temperature: 85± 2 °C 2. Duration: 24±2hrs 3. Recovery: 1-2hrs
Low Temperature Resistance	1. No apparent damage 2. Fulfill the electrical specification after test	1. Temperature: -40°± 5 °C 2. Duration: 24 ±2hrs 3. Recovery: 1-2hrs
Humidity Resistance	1. No apparent damage 2. Fulfill the electrical specification after test	1. Temperature: 85± 2°C 2. Humidity: 80% ~ 85% RH 3. Duration: 1000±48hrs 4. Recovery: 1-2hrs
Soldering strength (Push strength)	1. 9.8N minimum	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 (Bending)	1. No apparent damage 2. Fulfill the electrical specification	1. Solder specimen onto test jig (FR4, 0.8mm) using the recommend soldering profile. 2. Apply a bending force of 2mm deflection 、 
Drop Shock	1. No apparent damage	1. Dropped onto hard wood from height of 50 cm for 3 times ; each x,y and z direction except terminal direction

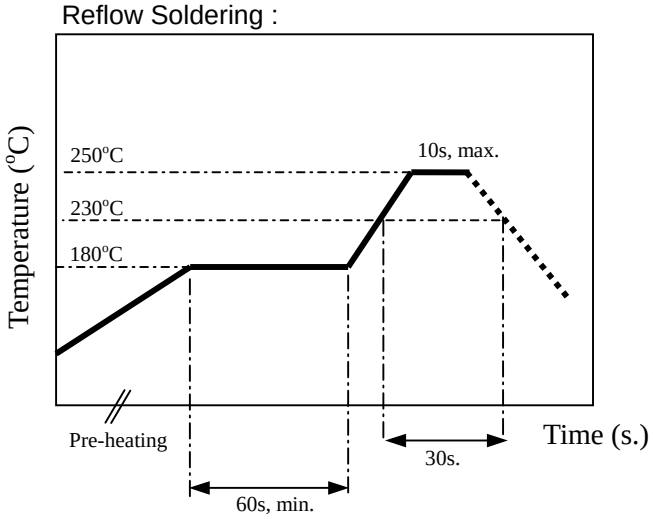
Typical Soldering Profile

❖Typical Soldering Profile for Lead-free Process

Flow Soldering :



Reflow Soldering :



The sample must be pre-heated before soldering .The temperature difference between preheating and soldering must be within 150 ℃.

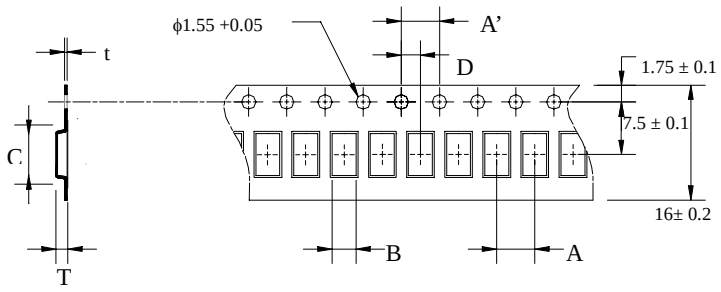
Notes

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

ACX
Advanced Ceramic X

Taping Specifications

❖Tape Dimensions (Unit: mm)

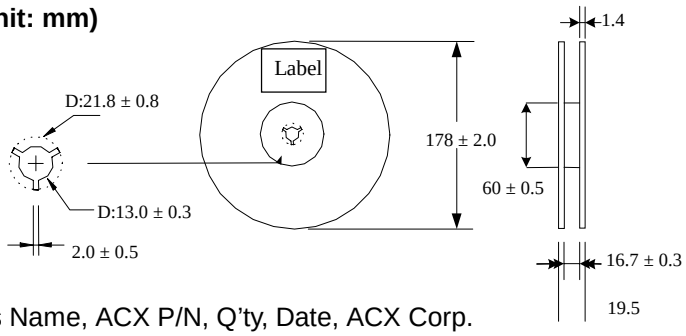


Type	A	A'	B	C	D	t	T
3216	4.0± 0.1	4.0± 0.1	1.9± 0.1	3.5± 0.1	2.0± 0.1	0.20± 0.05	Max. 1.4
5020	4.0± 0.1	4.0± 0.1	2.4± 0.1	5.5± 0.1	2.0± 0.1	0.20± 0.05	Max. 1.4
7020	4.0± 0.1	4.0± 0.1	2.4± 0.1	7.3± 0.1	2.0± 0.1	0.22± 0.05	Max. 1.55
7635	8.0± 0.1	4.0± 0.1	3.75± 0.1	7.85± 0.1	2.0± 0.1	0.30± 0.05	Max. 1.40
8516	4.0± 0.1	4.0± 0.1	1.85± 0.1	8.70± 0.1	2.0± 0.1	0.25± 0.05	Max. 1.40
9520	4.0± 0.1	4.0± 0.1	2.3± 0.1	9.7± 0.1	2.0± 0.1	0.22± 0.05	Max. 1.45
R130	8.0± 0.1	4.0± 0.1	3.35± 0.1	10.35 ±0.1	2.0± 0.1	0.25± 0.05	Max. 1.40

❖Quantity

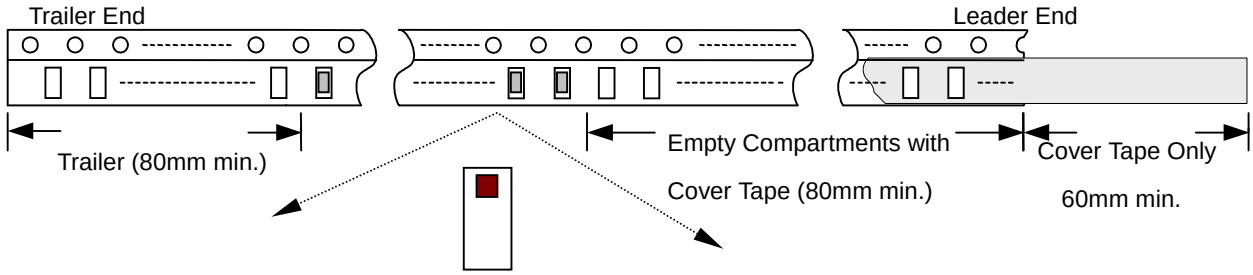
Type	3216	5020	7020	7635	8516	9520	R130
Quantity /per reel	3,000pcs	2,000	1,000 pcs	1,000 pcs	1000pcs	1,000 pcs	1,000 pcs

❖Reel Dimensions (Unit: mm)

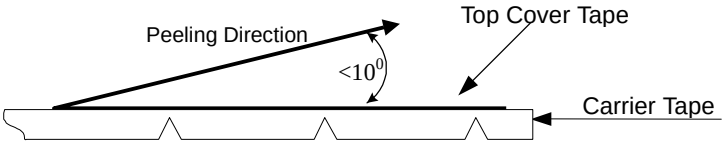


Label: Customer's Name, ACX P/N, Q'ty, Date, ACX Corp.

❖Leader and Trailer Tape (Plastic material)



❖Peel-off Force

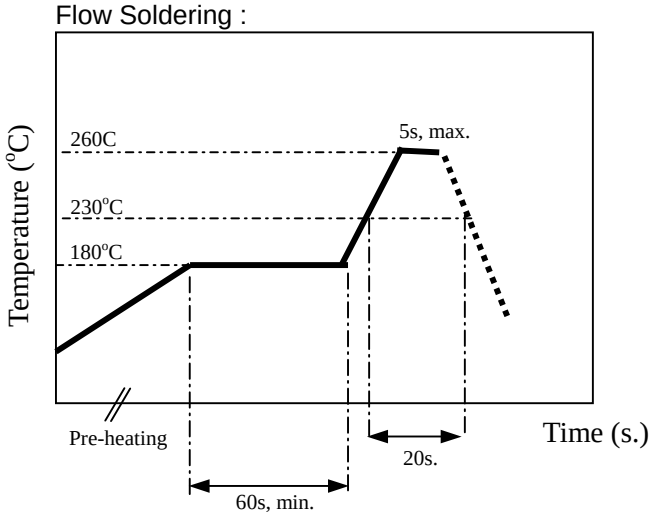


Peel-off force should be in the range of 0.1 – 0.6 N at a peel-off speed of 300±10 mm/min .

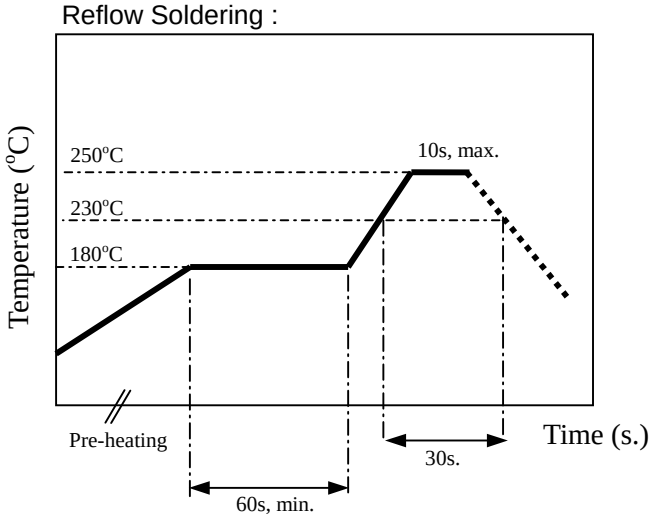
Typical Soldering Profile

❖Typical Soldering Profile for Lead-free Process

Flow Soldering :



Reflow Soldering :



The sample must be pre-heated before soldering .The temperature difference between preheating and soldering must be within 150 ℃.

Notes

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

❖**Storage Conditions**

(1) Temperature: 15 ~35℃, relative humidity (RH): 45~75%.
(2) Non-corrosive environment
(3) Products should be used within six months of receipt.

Notes

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

Test Report

No. : CE/2013/30838 Date : 2013/03/11

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 :

Applicant	:	ADVANCED CERAMIC X (ACX) CORPORATION
Sample Description	:	MULTILAYER LTCC-A COMPONENTS (CERAMIC BODY)
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
Buyer/Order No.	:	LOCAL COMPANY OR USA COMPANY
Sample Receiving Date	:	2013/03/04
Testing Period	:	2013/03/04 TO 2013/03/11

==========

Test Requested : 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.

Test Method : With reference to IEC 62321: 2008.

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

SGS TAIWAN LTD SGS TAIWAN

Chenyu Kung / Operation Manager
Signed for and on behalf of
SGS TAIWAN LTD.
Chemical Laboratory – Taipei

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 (CERAMIC BODY)

Test Item(s)	Unit	Method	MDL	Result
				No.1
Cadmium (Cd)	mg/kg	With reference to IEC 62321: 2008 and performed by ICP-AES.	2	n.d.
Lead (Pb)	mg/kg	With reference to IEC 62321: 2008 and performed by ICP-AES.	2	14
Mercury (Hg)	mg/kg	With reference to IEC 62321: 2008 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	mg/kg	With reference to IEC 62321: 2008 and performed by GC/MS.	-	n.d.
Monobromobiphenyl	mg/kg		5	n.d.
Dibromobiphenyl	mg/kg		5	n.d.
Tribromobiphenyl	mg/kg		5	n.d.
Tetrabromobiphenyl	mg/kg		5	n.d.
Pentabromobiphenyl	mg/kg		5	n.d.
Hexabromobiphenyl	mg/kg		5	n.d.
Heptabromobiphenyl	mg/kg		5	n.d.
Octabromobiphenyl	mg/kg		5	n.d.
Nonabromobiphenyl	mg/kg		5	n.d.
Decabromobiphenyl	mg/kg		5	n.d.
Sum of PBDEs	mg/kg		-	n.d.
Monobromodiphenyl ether	mg/kg		5	n.d.
Dibromodiphenyl ether	mg/kg		5	n.d.
Tribromodiphenyl ether	mg/kg		5	n.d.
Tetrabromodiphenyl ether	mg/kg		5	n.d.
Pentabromodiphenyl ether	mg/kg		5	n.d.
Hexabromodiphenyl ether	mg/kg		5	n.d.
Heptabromodiphenyl ether	mg/kg		5	n.d.
Octabromodiphenyl ether	mg/kg		5	n.d.
Nonabromodiphenyl ether	mg/kg		5	n.d.
Decabromodiphenyl ether	mg/kg		5	n.d.

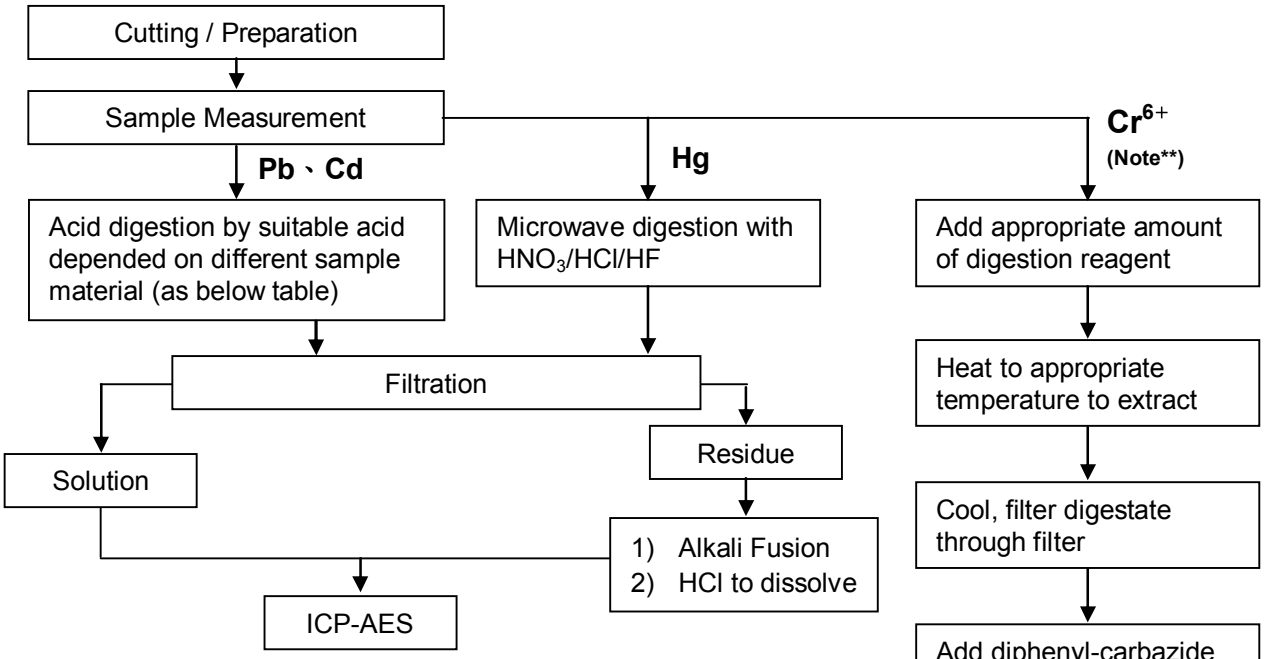
ADVANCED CERAMIC X (ACX) CORPORATION
16 TZU CHIANG ROAD, HSINCHU INDUSTRIAL DISTRICT, HSINCHU HSIEN, TAIWAN 303

Note：

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

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. （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



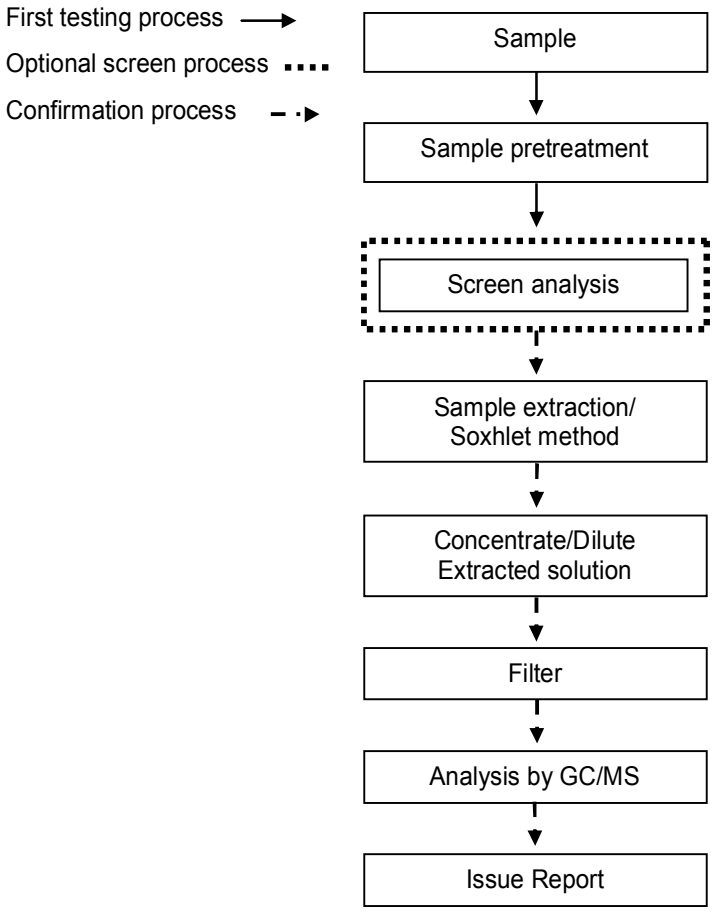
Sample Material	Digestion Acid
Steel, copper, aluminum, solder	Aqua regia, HNO_3, HCl, HF, H_2O_2
Glass	HNO_3/HF
Gold, platinum, palladium, ceramic	Aqua regia
Silver	HNO_3
Plastic	H_2SO_4, H_2O_2, HNO_3, HCl
Others	Added appropriate reagent to total digestion

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.

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

PBB/PBDE analytical FLOW CHART

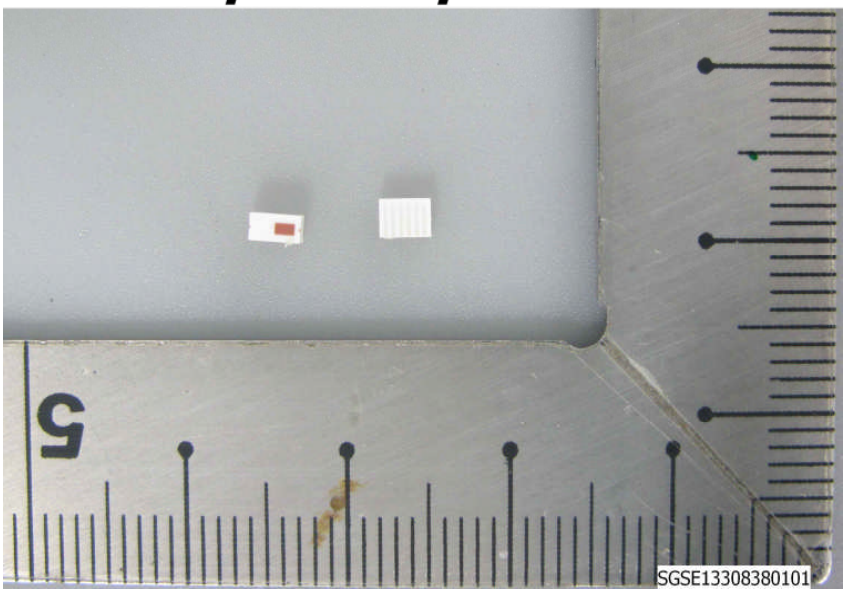
- Name of the person who made measurement: Roman Wong
- Name of the person in charge of measurement: Troy Chang



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

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

CE/2013/30838



** End of Report **