盛達科技股份有限公司 Anttech Electronics Corp.

APPROVAL SHEET

Date: 2007/03/05

Customer： 智捷科技(股)公司

ANTTECH P/N： AT5020-B2R8HAAT/LF

Description： Antenna

Customer P/N：

Model name：

Contact person： 林 宜 君　Vita Lin

Contact TEL： 886-2-2950-0366#360／0937-898-812

Attachment：

- ■ SPECIFICATION
- ■ SAMPLE
- □ TEST REPORT

Engineer	Q.A. Dept.	Approved

ACX
Advanced Ceramic X

AT5020 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
AT5020 -B2R8HAA_	2400 ~ 2500	0 dBi typ.	-1 dBi typ.	2 max.	50 Ω

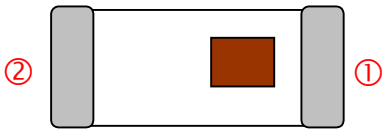
Q'ty/Reel (pcs) : 2,000pcs
Operating Temperature Range : -40 ~ +85 °C
Storage Temperature Range : -40 ~ +85 °C
Power Capacity : 3W max.

Part Number

AT ① 5020 ② - B ③ 2R8 ④ HAA ⑤ □ ⑥ □ ⑦

① Type	AT : Antenna	② Dimensions (L × W)	5.0× 2.0 mm
③ Material Code	B	④ Frequency Range	2R8=2800MHz
⑤ Specification Code	HAA	⑥ Packaging	T: Tape & Reel B: Bulk
⑦ Soldering	=lead-containing /LF=lead-free		

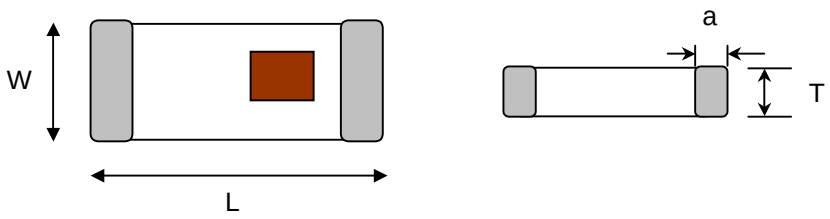
Terminal Configuration



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

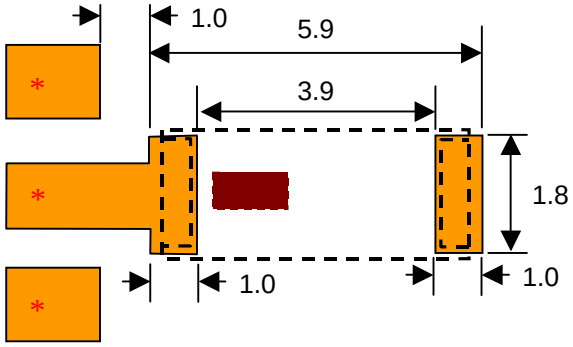
Dimensions and Recommended PC Board Pattern

Unit : mm

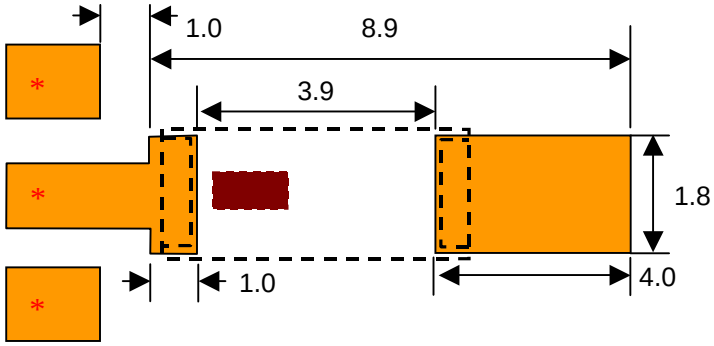


Mark	L	W	T	a
Dimensions	5.0±0.2	2.0±0.2	1.1±0.2	0.5±0.3

(a) Without Matching Circuits



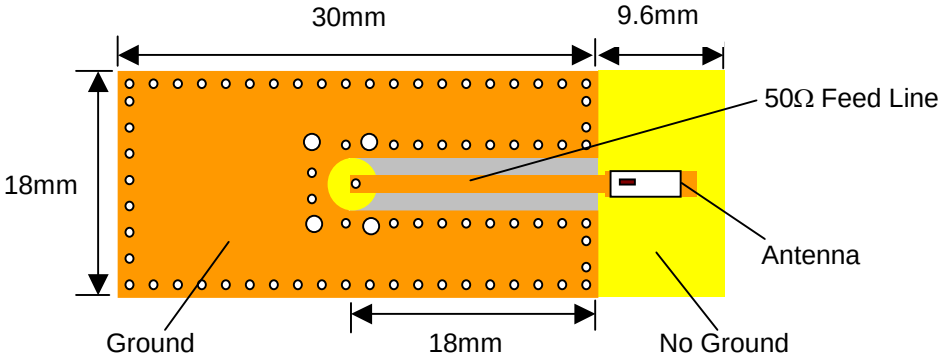
(b) With Matching Circuits



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

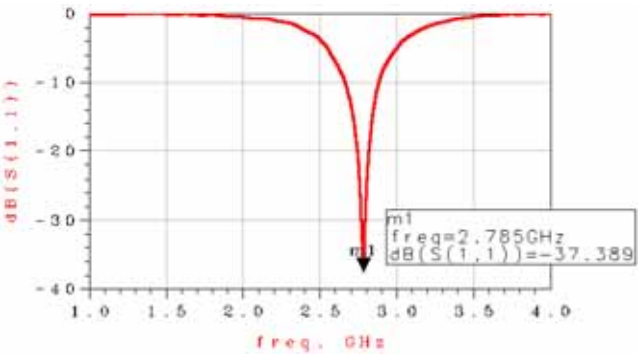
Typical Electrical Characteristics (T=25°C)

❖Test Board

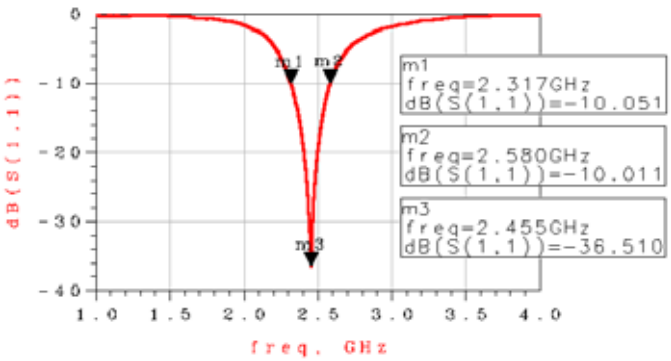


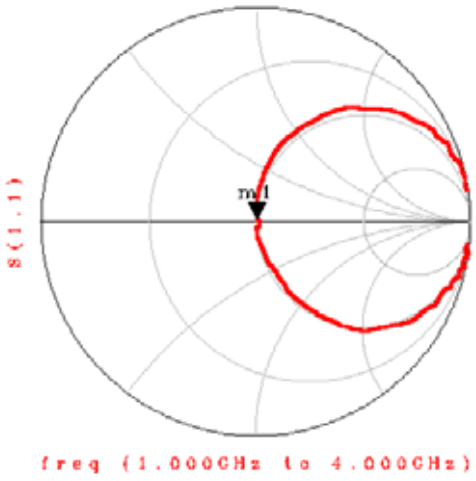
❖Return Loss

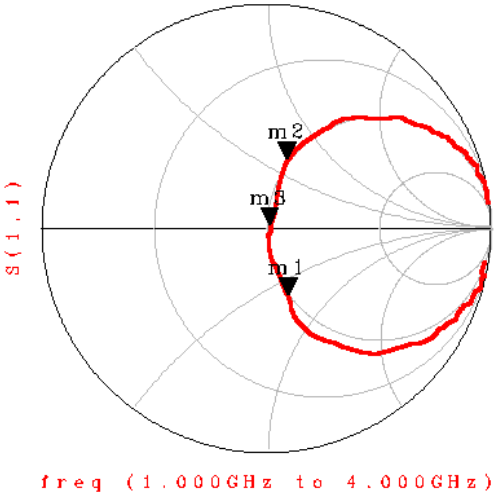
(a) Without Matching Circuits



(b) With Matching Circuits

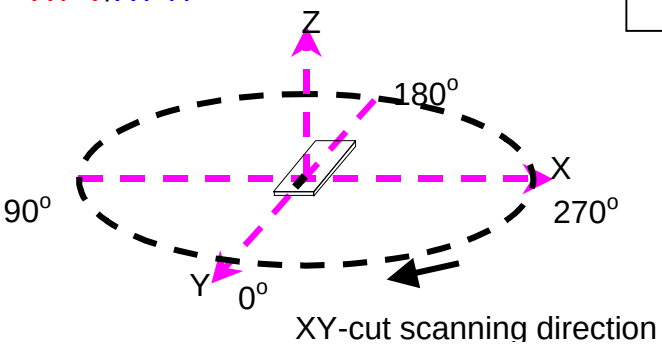




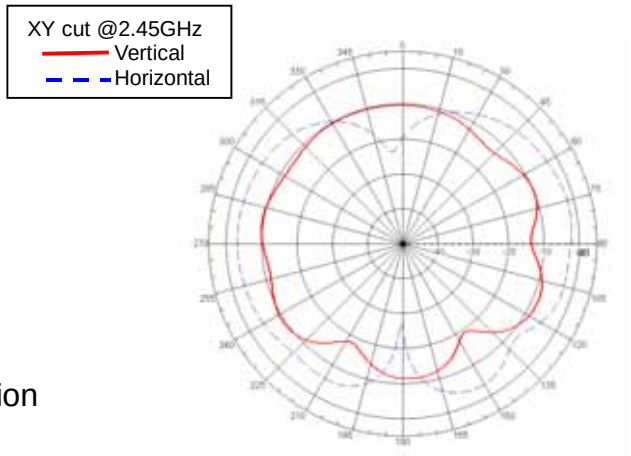


ACX
Advanced Ceramic X

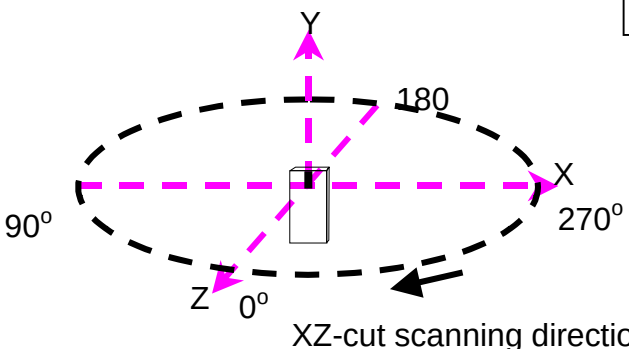
XY-V/XY-H



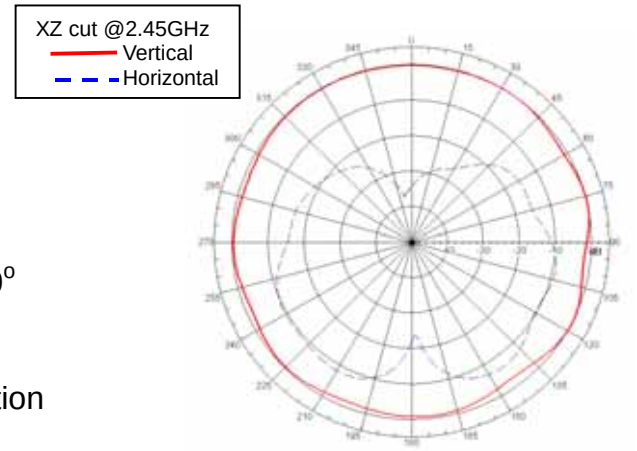
XY-cut scanning direction



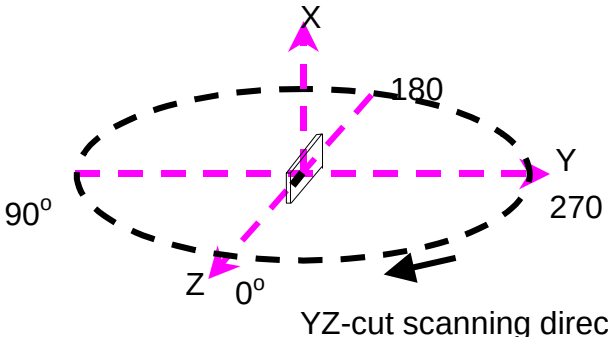
XZ-V/XZ-H



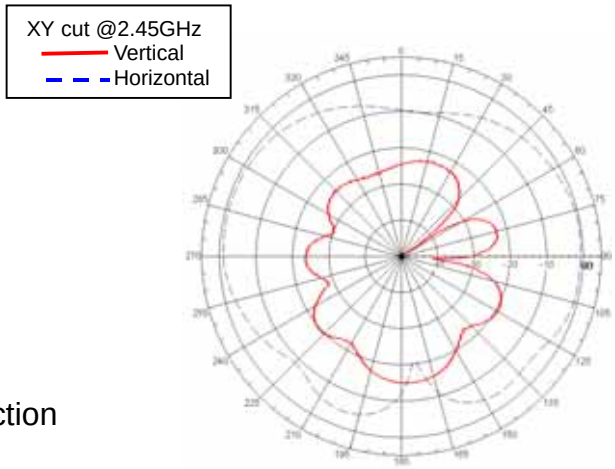
XZ-cut scanning direction



YZ-V/YZ-H

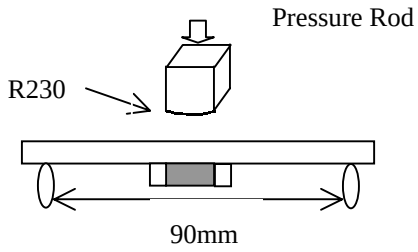


YZ-cut scanning direction



ACX
Advanced Ceramic X

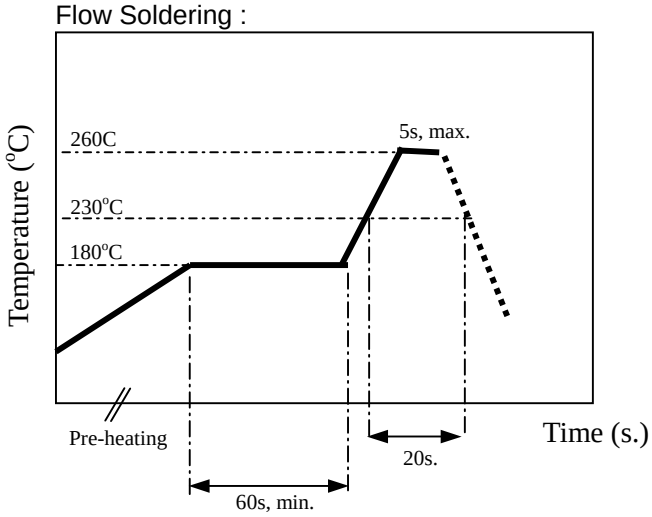
Mechanical & Environmental Characteristics

	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

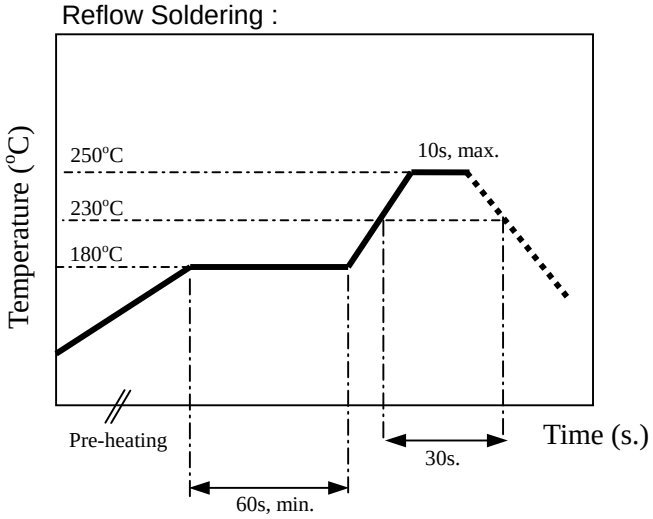
Typical Soldering Profile

❖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 ℃.

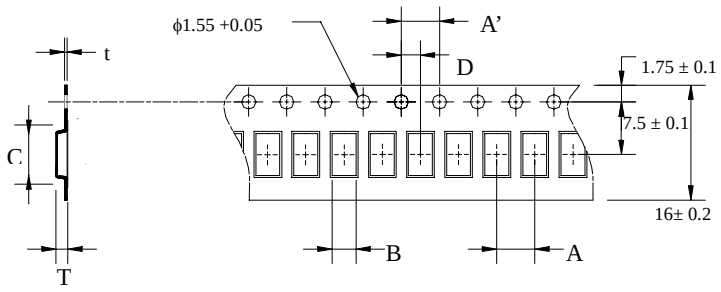
Notes

❖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)

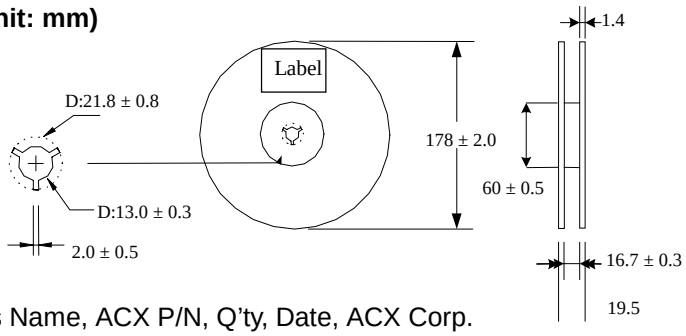


Type	A	A'	B	C	D	t	T
3216	4.0± 0.1	4.0± 0.1	1.9± 0.1	3.5± 0.1	2.0± 0.1	0.20± 0.05	Max. 1.4
5020	4.0± 0.1	4.0± 0.1	2.4± 0.1	5.5± 0.1	2.0± 0.1	0.20± 0.05	Max. 1.4
7020	4.0± 0.1	4.0± 0.1	2.4± 0.1	7.3± 0.1	2.0± 0.1	0.22± 0.05	Max. 1.55
7635	8.0± 0.1	4.0± 0.1	3.75± 0.1	7.85± 0.1	2.0± 0.1	0.30± 0.05	Max. 1.40
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

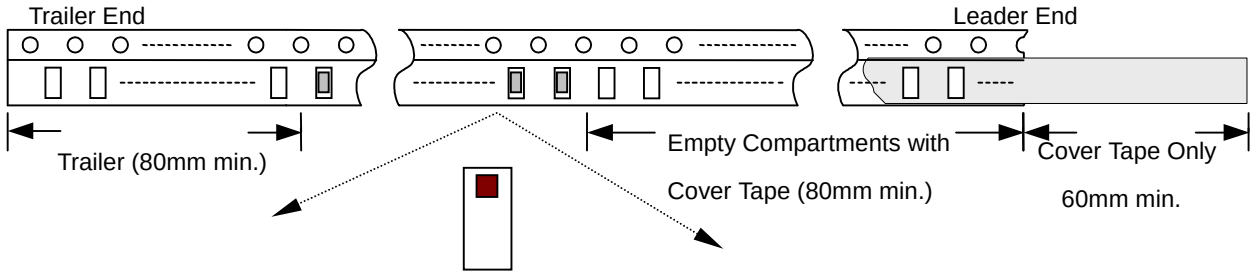
Type	3216	5020	7020	7635	8516	9520	R130
Quantity /per reel	3,000pcs	2,000	1,000 pcs	1,000 pcs	1000pcs	1,000 pcs	1,000 pcs

❖Reel Dimensions (Unit: mm)

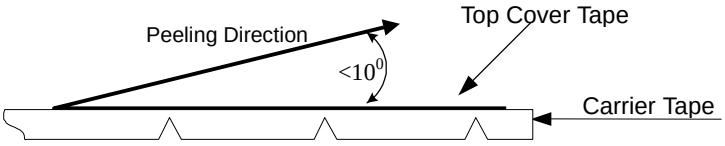


Label: Customer's Name, ACX P/N, Q'ty, Date, ACX Corp.

❖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 .

❖**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

ADVANCED X CORPORATION.
16 TZU CHIANG ROAD, HSINCHU INDUSTRIAL DISTRICT, HSINCHU HSIEN, TAIWAN 30316.

Report No. : CE/2006/57261
Date : 2006/05/29
Page : 1 of 3

The following merchandise was (were) submitted and identified by the client as :

Type of Product	:	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, HI SERIES, HF SERIES, LF SERIES, NF SERIES, TS SERIES, LTCC SUBSTRATES, ZV4, ZV5
Buyer/Order No	:	LOCAL COMPANY OR USA COMPANY
Sample Received	:	2006/05/22
Testing Date	:	2006/05/22 TO 2006/05/29

==========

Test Result : - Please see the next page -

Daniel Yeh, M.R. / Operation Manager
Signed for and on behalf of
SGS TAIWAN LTD.

Test Report

ADVANCED X CORPORATION.
16 TZU CHIANG ROAD, HSINCHU INDUSTRIAL DISTRICT, HSINCHU HSIEN, TAIWAN 30316.

Report No. : CE/2006/57261
Date : 2006/05/29

Test Result

PART NAME NO.1 : GRAY SLICE

Test Item (s):	Unit	Method	MDL	Result No.1
Monobromobiphenyl	%	With reference to USEPA3540C or USEPA3550C. Analysis was performed by HPLC/DAD, LC/MS or GC/MS. (prohibited by 2002/95/EC (RoHS), 83/264/EEC, and 76/769/EEC)	0.0005	N.D.
Dibromobiphenyl	%		0.0005	N.D.
Tribromobiphenyl	%		0.0005	N.D.
Tetrabromobiphenyl	%		0.0005	N.D.
Pentabromobiphenyl	%		0.0005	N.D.
Hexabromobiphenyl	%		0.0005	N.D.
Heptabromobiphenyl	%		0.0005	N.D.
Octabromobiphenyl	%		0.0005	N.D.
Nonabromobiphenyl	%		0.0005	N.D.
Decabromobiphenyl	%		0.0005	N.D.
Total PBBs (Polybrominated biphenyls)/Sum of above	%		-	N.D.
Monobromobiphenyl ether	%	With reference to USEPA3540C or USEPA3550C. Analysis was performed by HPLC/DAD, LC/MS or GC/MS. (prohibited by 2002/95/EC (RoHS), 83/264/EEC, and 76/769/EEC)	0.0005	N.D.
Dibromobiphenyl ether	%		0.0005	N.D.
Tribromobiphenyl ether	%		0.0005	N.D.
Tetrabromobiphenyl ether	%		0.0005	N.D.
Pentabromobiphenyl ether	%		0.0005	N.D.
Hexabromobiphenyl ether	%		0.0005	N.D.
Heptabromobiphenyl ether	%		0.0005	N.D.
Octabromobiphenyl ether	%		0.0005	N.D.
Nonabromobiphenyl ether	%		0.0005	N.D.
Decabromobiphenyl ether	%		0.0005	N.D.
Total PBBEs(PBDEs) (Polybrominated biphenyl ethers)/Sum of above	%		-	N.D.
Total of Mono to Nona-brominated biphenyl ether. (Note 4)	%		-	N.D.

Test Report

ADVANCED X CORPORATION.
16 TZU CHIANG ROAD, HSINCHU INDUSTRIAL DISTRICT, HSINCHU HSIEN, TAIWAN 30316.

Report No. : CE/2006/57261
Date : 2006/05/29

Test Item (s):	Unit	Method	MDL	Result
				No.1
Chromium VI (Cr+6)	ppm	UV-VIS(US EPA 7196A) after reference to US EPA 3060A.	2	N.D.
Cadmium (Cd)	ppm	ICP-AES after reference to EN 1122, method B:2001 or other acid digestion.	2	N.D.
Mercury (Hg)	ppm	ICP-AES after reference to US EPA 3052 or other acid digestion.	2	N.D.
Lead (Pb)	ppm	ICP-AES after reference to US EPA 3050B or other acid digestion.	2	19.8

NOTE: (1) N.D. = Not detected (<MDL)
(2) ppm = mg/kg
(3) MDL = Method Detection Limit
(4) Decabromobiphenyl ether (DecaBDE) in polymeric applications is exempted by Commission Decision of 13 Oct 2005 amending Directive 2002/95/EC notified under document 2005/717/EC.
(5) PBBEs=PBDEs=Polybrominated Diphenyl Ethers=PBDOs=PBBOs.
(6) " - " = Not Regulation

智捷科技股份有限公司

新竹科學園區展業一路 9 號 7 樓之 2
TEL：(03) 577-7364
FAX：(03) 577-3359

禁用物質材料分析表

日期：2007/03/09

料號：AT5020-B2R8HAAT/LF　　品名：**Antenna**

Type of Product	Report No.	Report Date	鉛 Pb (ppm)	鎘 Cd (ppm)	汞 Hg (ppm)	六價鉻 Cr^{6+} (ppm)	聚溴聯苯 PBBs (%)	聚溴本醚 PBDEs (%)	符合例外條款（Y/N）
Ceramic Body	CE/2006/57261	2006/05/29	1592.46	ND	ND	ND	ND	ND	Y
Termination	CE/2006/57261	2006/05/29	0.758	ND	ND	ND	ND	ND	N

Reflow 耐溫條件：	260℃ 5s

化學物質名稱	化學式	CAS No	化學值 (%)

填寫人：林宜君

智捷科技股份有限公司
新竹科學園區展業一路9號7樓之2
TEL:(03) 577-7364
FAX:(03) 577-3359

保 證 書

為保證本公司售予智捷科技股份有限公司(簡稱"智捷")之產品符合環境禁用物質(RoHS 規範)，並承諾如有第三人向智捷或其相關人員主張其不符合上述規範時，本公司願無條件賠償智捷因此所受之損害，並為智捷提出抗辯並使其相關當事人不受任何侵害。

為此，本公司承諾如下：

一. 若智捷科技股份有限公司或其受雇人、高級職員、董事、經銷商、代理商、零售商因智捷採購本公司零組件或材料而製成之產品被訴或被指稱有違反任何國家之環境禁用物質之規定(以下簡稱"違反情事")情事時，本公司應：

(一) 本公司應協助智捷科技股份有限公司進行上述案件之調查、訴訟上防禦以及和解事宜。

(二) 任何源於或關於上述違反情事或指稱所造成的損害，本公司願意獨自負責，並補償智捷及其相關人員所受之一切損害。

二. 配合前項所述，本公司願意補償智捷及相關人員，就侵害訴訟情事所生之有關費用：

(一) 在侵害訴訟過程中因答辯所生之一切之訴訟費用、律師費用及其他費用。

(二) 因確定判決或和解而判定或致使智捷或其受雇人、高級職員、董事、經銷商、代理商、零售商所支出之所有費用或應支付之損害賠償。

三. 若智捷需以和解方式解決前述之侵害訴訟情事，智捷若因此需支付權利金予原告或權利人時，則由本公司支付該合解或賠償金予智捷之後，再由智捷轉付予原告或權利人。

四. 本公司完全同意以上所列各項條款、條件。

此致 智捷科技股份有限公司

公司名稱：

代表人：

姓名：

職稱：

地址：

中 華 民 國 九十六 年 三 月 五 日

負 責 人 保 證 函

公司名稱：_____

負責人姓名：_____

日期：96 年 3 月 5 日

有關產品中所含物質的保證書

本公司(包括子公司和協力廠商)特此保證：提供給貴公司，貴公司之子公司或協力廠商/(此後統稱"貴公司")的所有產品或部件，決不包含以下所列物質。

「符合 SS-00259 規定的禁用物質」

重金屬	鎘以及鎘化合物
	鉛以及鉛化合物
	汞以及汞化合物
	六價鉻化合物
有機氯化合物	聚氯聯苯 (PCB)
	聚氯化萘 (PCN)
	聚氯三聯苯(PCT)
	氯代烷氫 (CP)
	其他有機氯化合物
有機溴化合物	聚溴聯苯 (PBB)
	聚溴二苯醚 (PBDE)
	其他有機溴化合物
有機錫化合物 (三丁基錫化合物、三苯基錫化合物)	
石棉	
偶氮化合物	
甲醛	
聚氯乙烯 (PVC) 以及聚氯乙烯混合物	