



## 铝基板介绍

### Al-Substrate CCL Introduction

类型 Type	介绍 Introduction
中高导热型 (HA40) High Thermal Conductivity Type (HA40)	热导率 1.0~2.0 W/ M·K, 可满足中高端产品需求, 性价比高; Thermal conductivity 1.0~2.0 W/ M·K, It can fit the demand of high end and mid-range products, with high cost performance.

### 基本结构 Basic Structure



### 说明 / Instruction

导电层—电解铜箔 / Circuit Layer – Electrolysis copper foil

导热绝缘层—以最小的热阻提供电学上的绝缘, 分为玻璃布增强型和无玻璃布增强型两种

Thermally Conductive Dielectric Layer –This offers electrical isolation with minimum thermal resistance. two types: Fiberglass support & non-fiberglass support.

铝基层—是整个结构的支撑和热量的发散, 材料为铝合金板

Aluminum Substrate-It supports the entire structure and conducts the heat.

The material is aluminum alloy plate.

### 特性/ Features

优异的散热性能	Excellent thermal conductivity
良好的尺寸稳定性能	Excellent dimensional stability
良好的机械加工性能	Excellent mechanical properties
电磁屏蔽性能	Excellent electromagnetic shielding
可直接外接散热装置	Can use external cooling device directly
优良的性价比	High cost performance

### 应用领域 / Application

LED 照明电路	LED lighting circuit
电源电路	Power supply
混合集成电路	Hybrid integrated circuits
固态继电器	Solid State Relays
LCD 背光源	LCD Backlights
需要高散热的领域	The area needs high heat dissipation

### 主要性能 Main property



项目 Item	处理条件 Test condition	单位 Units	指标值 Spec	典型值 Typical Value	
				类型 1 / Type1	类型 2 / Type2
热阻 Thermal Impedance	A Internal TO-220	°C/W	≤1.0	0.7	0.45
热导率 Thermal Conductivity	A ASTM 5470-D	W/ M·K	1.0-2.0	1.3	2.0
剥离强度 Peel Strength	A	N/mm	≥1.4	1.95	1.84
	热应力后			1.85	1.73
热应力 Thermal Stress	288°C, solder dip	S	≥20	120S No delamination	120S No delamination
表面电阻 Surface Resistivity	C96/35/90	MΩ	≥10 <sup>4</sup>	10 <sup>6</sup>	10 <sup>6</sup>
	E-24/125		≥10 <sup>3</sup>	10 <sup>5</sup>	10 <sup>5</sup>
体积电阻 Volume Resistivity	C96/35/90	MΩ·cm	≥10 <sup>6</sup>	10 <sup>7</sup>	10 <sup>7</sup>
	E-24/125		≥10 <sup>3</sup>	10 <sup>5</sup>	10 <sup>5</sup>
电气强度 Electrical Strength	A IPC-TM-650 2.5.6.2	KV/mm	≥20	30	30
介电常数 (1MHz) Dielectric Constant	C 24/23/50 IPC-TM-650 2.5.5.2	—	—	7.0	7.0
耐电弧 Arc Resistance	D48/50+D0.5/23 IPC-TM-650 2.5.1	S	≥60	120	120
燃烧性 Flammability	E-24/125	—	V-0	V-0	V-0
Tg	DSC	°C	>110	121.2	122.6
吸水率 Water Absorption	D-24/23 IPC-TM-650 2.6.2.1	%	≤0.5	0.3	0.3
CTI	IEC60112	V	≥175	200	200

\* 热阻系数均为 1.6mm 基材，铜箔厚度 1oz 下的测量值，热导率为绝缘层介质的热导率参数

\* Thermal impedance is based on the measured value of 1.6mm base material with 1oz Copper foil.

Thermal conductivity is the parameters of thermally conductive dielectric layer.

### 产品规格 Specification

标准尺寸 Standard Size (mm)	500mm×600mm、 500×1200mm、 600mm×1200mm、 1100mm×1200mm
导电层 Circuit Layer (电解铜箔 Copper foil)	18μm、 35μm、 70μm、 105μm (Hoz、 1oz、 2oz、 3oz)
导热绝缘层厚度 Thermally Conductive Dielectric Layer Thickness	75μm、 100μm、 125μm、 150μm(3mil、 4mil、 5mil、 6mil)
铝基层厚度 Aluminum Substrate Thickness	1.0mm、 1.2mm、 1.5mm、 2.0mm
铝板类型 Aluminum Substrate Type	5052 (H32)、 1060 (H22)

※如有特殊要求，可定制 Other sheet size and thickness could be available upon request



## 覆铜铝基线路板的加工、使用建议书

### Aluminum Copper Clad Laminates Operations Guide

1. 首先感谢你！使用我司产品，在使用本材料时，请看完本建议书。

**Many thanks for using our company' s product. Please kindly sit through this Operations Guide then using our material.**

2. 裁切加工时：注意刀口必须锋利、无缺口、无损伤，间隙小、均匀，压制力度一致、均匀，可避免板边、板角分层；

**On cutting process: Make sure the edge must be sharp, non gap, equality. That will prevent delamination on corner of material.**

3. 钻孔、捞边加工时：进刀慢、转速慢，最好有降温措施，可避免拉毛、分层；

**One drill and Rout process: Make sure the speed of enter must be slowly, Rotate speed also must be slowly. Having cooling measures is better. That will prevent delamination and chip.**

4. 保护膜：

a) pe 膜(常温 50℃/2H 蓝色) 建议作业时保护膜面勿清刷，作业温度不超过 50℃，并于线路蚀刻后撕去保护膜，再进行防焊、文字、喷锡……其延展性较好，对撕开、剥离有比较好的作业性，但鑽孔位置容易有拉开 3~5mm 的开口，建议成品板内的孔，于蚀刻后撕开保护膜再鑽，



可避免药水腐蚀铝板；

PE Film (normal temperature 50°C/2H blue color) We suggest in process please protect film, do not brush the film. Keeping Temperature of operation not more than 50°C, And please release film after etch process, then do other process e.g. Solder mask and HAL.

Some times the position of drilling will appear 3~5mm opening, so we also suggest after release film then arrange drilling process. It will avoid the liquid medicine through opening then etch Aluminum board.

b) pet 膜(中温 160°C/2H 绿色) 建议作业时保护膜面勿清刷，作业温度不超过 160°C，建议于防焊、文字后撕去保护膜，再进行喷锡……其延展性较差、较脆，对文字、防焊后再撕开保护膜没问题，但比较容易破裂；

PET Film (Middle temperature 160°C/2H green color) We suggest in process please protect film, do not brush the film. Keeping Temperature of operation not more than 160°C, And please release film after Solder mask process, then do HAL process.

The expansibility of PET film is normal. It's easy to breach.



c) pi 膜(高温 260°C/0.5H 橙色) 建议作业时保护膜面勿清刷，一般用于无铅制程，可避免污染喷锡槽，正常作业喷锡三次没问题；(目前只能提供 500~600mm 宽的膜)

PI Film (High temperature 260°C/0.5H orange color) We suggest in process please protect film, do not brush the film. Using on LEAD FREE process, can avoid pollute tin bath. Normally Pi film can endure HAL three times. (Now we can support film which wide size is from 500~600mm)

5. 喷锡工序：喷锡前烘烤到 150°C，可将瞬间温差距离拉近，避免因材料涨缩不同而分层，建议喷锡工作温度不超 288°C；

HAL process: We suggest bake the material at 150°C before HAL process. It will reduce difference in Temperature. That will prevent delamination. We suggest Temperature on HAL process must not more than 288°C

6. 冲床外型加工时：模具必须锋利、无缺口、无损伤，间隙小、均匀，可避免板边、板角分层，建议用精冲工艺；

On Punch overall processing: Mold must be sharp, non gap, equality. That will prevent delamination on corner of material. We suggest using extract punch technology.



7. 铝板型号的选择：铝板硬度的比较 5052 H32 硬度大于 1060 H22；因此冲、切上 5052 H32 优于 1060 H22；弧形加工则 1060 H22 优于 5050H32；可依需要选择铝板型号。

As far as choosing the type of Aluminum Rigidity of type 5052 H32 is better than type 1060 H22. So that operation like rush and cut 5052 H32 type better than type 1060 H22. But operate camber 1060H22 type better than 5052 H32 type. You can choose aluminum type follow your application.



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## 物质安全资料表 (MSDS)

### MATERIAL SAFETY DATA SHEET

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#### 1.产品及公司名称 PRODUCT AND COMPANY IDENTIFICATION

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产品名称:	铝基覆铜箔板
PRODUCT NAME:	ALUMINUM SUBSTRATE COPPER CLAD LAMINATE
产品用途:	用于 LED 照明电路、电源电路、混合集成电路、固态继电器等需要高散热的领域
PRODUCT USE:	Base material for LED lighting circuit、Power supply、Hybrid integrated circuits、Solid State Relays、and the area needs high heat dissipation.

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#### 2.产品的主要成分/原料 MAIN COMPOSITION/INFORMATION ON INGREDIENTS

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原料名称	重量% (典型值)
INGREDIENT NAME	WEIGHT% (typical)
铝合金:	83~92
Aluminum:	
铜箔:	5~9
copper:	
环氧树脂层压板:	3~8
Epoxy laminate:	

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#### 3.危险性 HAZARDS IDENTIFICATION

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摄食:	中等毒性, 可能导致恶心、呕吐及腹泻
INGESTION:	Moderately toxic. May cause nausea, vomiting, and diarrhea.
皮肤:	长时间接触可能导致皮肤过敏
SKIN:	Prolonged exposure may cause irritation. 轻度刺激性, 直接接触眼睛会导致眼睛红肿、流泪
眼睛:	Mildly irritating. May cause redness or watering of eyes on direct contact.
EYES:	常温下, 物性稳定。高温下会产生刺激性气体
吸入物:	



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INHALATION: At room temperature, exposure is not likely due to physical properties. Higher temperatures may cause vapor levels sufficient to cause irritation.

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#### 4.首要援助措施 FIRST AID MEASURES

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摄食: 吸食少量可催吐, 吸食大量应立即求助医生  
INGESTION: Get medical attention. Do not induce vomiting unless large amounts are ingested or medical 脱下已污染衣服, 用流动水洗。  
皮肤: Wash in flowing water or shower, remove contaminated clothing. 用  
SKIN: 流动水冲洗 15 分钟, 如过敏现象持续发生, 请求助于医生。  
眼睛: Irrigate with flowing water for 15 minutes. If irritation persists  
EYE: consult a physician.  
吸入: 没有预期的急救护理  
INHALATION: No emergency care anticipated

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#### 5.物理性能 PHYSICAL AND CHEMICAL PROPERTIES

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外观: 层压板  
APPEARANCE: Laminate  
物理形态: 固体  
Physical State: Solid  
气味: 无味, 除非加热  
ODOR: None, unless heated  
比重: (水=1.0)  $2.87\pm 0.30$   
SPECIFIC GRAVITY: (Water=1.0)  $2.87\pm 0.30$   
水溶性: (重量%) 在水中可忽略  
SOLUBILITY IN WATER: (Weight%) Negligible in water

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#### 6.火灾测试 FIRE FIGHTING MEASURES

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易燃性: 不适用  
FLAMMABLE PROPERTIES: N/A 不  
闪点: 适用  
FLASH POINT: N/A 不  
闪点方式: 适用  
FLASH POINT METHOD: N/A 无  
自燃点温度: 规定  
AUTOIGNITION TEMPERATURE: Not determined  
燃烧上限: 不适用  
UPPER FLAME LIMIT (volume% in air): N/A




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燃烧下限:	不适用
LOWER FLAME LIMIT (volume% in air) :	N/A
燃烧等级:	UL V-0
FLAME PROPAGATION RATE(solids):	UL V-0
OSHA 燃烧级别:	不适用
OSHA FLAMMABILITY GLASS:	N/A
灭火介质:	水、CO <sub>2</sub> 及干粉化合物
EXTINGUISHING MEADIA:	Water、CO <sub>2</sub> and dry chemical
特别火灾指导:	
SPECIAL RIREFIGHTIONG PRECAUTIONS/INSTRUCTIONS: 灭火人员应佩戴保护装置及正压自给式呼吸器, 以便分解燃烧产物如 CO、氮氧化合物、酚类及氰化物等。Fire fighting personnel should wear positive pressure self-contained breathing apparatus for protection form decomposition products such as carbon monoxide, nitrogen oxides, phenols, and cyanides.	

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## 7.稳定性及反应性 STABILITY AND REACTIVITY

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通常稳定:	稳定 Stable 产品与酸、碱、氧化剂接触会产生易燃气体 Product generated flammable gas on contact with acids, bases, or oxidizing agents.
NORMALLY STABLE:	
危险的环境条件:	强氧化物质
Conditions to Avoid:	Strong oxidizing materials and bases. 燃烧产生 CO、CO <sub>2</sub> 、SiO <sub>2</sub> 、HBr、NO <sub>x</sub> 、易燃的 碳氢化合物
危险的腐化产品:	
Materials to Avoid: 燃烧和分解的产物:	Burning can produce carbon monoxide, carbon dioxide, silicon dioxide, HBr、Oxides of nitrogen and flammable hydrogen gas.
Combustion/Decomposition Products:	

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## 8.意外事故的应变措施 ACCIDENTAL RELEASE MEASURES

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如有泄露或其它释放:	(通常身穿所推荐的保护设施) 有关泄露应报告当地政府。
INCASE OF SPILL OR OTHER RELEASE:	(Always wear recommended personal protection equipment).Spills and releases may have to be reported to local government.

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## 9. 仓储指南 HANDING AND STORAGE

储存在阴凉、干燥、通风的地方, 操作时需谨慎并注意个人清洁, 以避免对眼睛、皮肤和服装的接触。该物质基本不溶于水, 可耐迅速降解, 对水中生物可能有一定毒性, 避免排放到自然水域。



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Keep in a cool, dry, ventilated area. Practice caution and personal cleanliness to avoid contact with eyes, skin, and clothing. This product is essentially insoluble in water. It is resistant to rapid biodegradation and may be toxic to aquatic life. Avoid discharge to natural waters

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#### 10. 泄露控制个人防护 EXPOSURE CONTROLS/PERSONAL PROTECTION

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工程控制: ENGINEERING CONTROLS:	储存处应通风良好, 并配备洗眼台和淋浴器 Good room ventilation is expected to be satisfactory for storage and handling. Facilities storing or utilizing this material should be equipped with an eyewash station and a safety shower. 如长时间接触, 需佩戴耐腐蚀性手套、长袖服装、安全防护眼睛。室内如通风良好, 则不要佩戴口罩。Where prolonged contact is likely, wear chemical resistant gloves, long sleeves, and safety glasses with side shields. A respirator is not required if good ventilation is maintained.
个人防护措施: PERSONAL PROTECTIVE EQUIPMENT:	

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#### 11. 毒物学的资料 TOXICOLOGICAL INFORMATION

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敏感反应: IMMEDIATE(ACUTE)EFFECTS:	灰尘将导致眼、皮肤中度过敏。 Dust may cause moderate eye、skin and respiratory irritation.
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#### 12. 生态学资料 ECOLOGICAL INFORMATION

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非生物降解	Not biodegradable
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#### 13. 排放程序及废物处理 SPILL PROCEDURES AND WASTE DISPOSAL

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排放程序: SPILL PROCEDURES:	如果材料不被污染, 将其装入清洁的容器中再使用, 如果被污染, 将其装入容器中按政府要求处理。 If material is not contaminated, scoop it into clean containers for use. If contaminated, load it into containers by the Government required to deal with.
废物处置方法: WASTE DISPOSAL METHOD:	根据当地法规, 将加工处理出来的废物由合格的清运商进行添埋是可接受的处置方法。 Landfilling of cured material in a licensed facility in accordance with local regulations in acceptable disposal method.

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14.运输信息 TRANSPORTATION INFORMATION

保持包装完整。防止高温雨淋。

With integrated packing. Keep away with high temperature and raining.

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15.法规信息 REGULATORY INFORMATION

欧盟《关于在电气电子设备中限制使用某些有害物质指令》(2002/95/EC)

DIRECTIVE 2002/95/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL 《On the Restriction of the use of certain Hazardous Substances in electrical and electronic equipment》

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16.其他信息 OTHER INFORMATION

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