



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



## Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



### Description

The *500 Series Copper Clad Boards* are made of a laminate consisting of continuous woven glass cloth impregnated with epoxy resin. The boards are made of FR4 which is a flame retardant version of G-10 material.

### Applications & Usages

The boards are ideal for prototyping and small production runs. It is used by PCB manufacturers, design engineers, hobbyists, and students.

### Benefits and Features

- **Complies with UL** (file number E214381) **and IPC-4101C/21**
- **DICY (dicyandiamide) Cured System**
- **Easy to cut with no specialized equipment required**
- **UV blocking**
- **Available in 1 oz (1.37 mil, 35 µm) and ½ oz (0.67 mil, 17 µm) copper cladding**
- **Comes in 1/16" (1.60 mm) and 1/32" (0.80 mm) laminate thicknesses**

### Properties

<i>Physical Properties</i>	<i>Method</i>	<i>Specification</i>	<i>Value</i>
Moisture Absorption	IPC-TM-650 2.6.2.1	<0.80%	0.25%
Flammability	UL-94	94V-0	V0
<i>Thermal Properties</i>	<i>Method</i>	<i>Specification</i>	<i>Value</i>
Glass Transition Temperature (T <sub>g</sub> )	IPC-TM-650 2.4.25	>110	140 °C
CTE prior T <sub>g</sub> , z-axis	IPC-TM-650 2.4.24	—	50 ppm/°C
CTE after T <sub>g</sub> , z-axis	"	—	250 ppm/°C
Total Expansion (50-260 °C), z-axis	"	—	3.75%
Time to Delamination T260	IPC-TM-650 2.4.24.1	—	20 min
Time to Delamination T288	"	—	2 min
Thermal Degradation via TGA	ASTM D 3850	—	310 °C
Thermal Stress @288 °C	IPC-TM-650 2.4.13.1	>10 s	300 s
Maximum Operating Temp. (MOT)	UL 94	—	130 °C

<i>Electrical Properties</i>	<i>Method</i>	<i>Specification</i>	<i>Value</i>
Volume Resistivity After Moisture Resistance	IPC-TM-650 2.5.17.1	$>1 \times 10^6 \text{ m}\Omega\cdot\text{cm}$	$5 \times 10^8 \text{ m}\Omega\cdot\text{cm}$
Surface Resistivity After Moisture Resistance	"	$>1 \times 10^4 \text{ m}\Omega\cdot\text{cm}$	$5 \times 10^7 \text{ m}\Omega$
Dielectric Constant @1 GHz	IPC-TM-650 2.5.5.9	$<5.4$	4.2
Dissipation Factor @1 GHz	"	$>0.035$	0.015
Dielectric Strength	IPC-TM-650 2.5.6.2	$>762 \text{ V/mil}$	1 200–1 400 V/mil
Dielectric Breakdown	IPC-TM-650 2.5.6	$>40 \text{ kV}$	60 kV
Comparative Tracking Index (CTI)	ASTM D 3638	—	Grade 3, 175–250 V
Arc Resistance	IPC-TM-650 2.5.1	$>60 \text{ s}$	240 s
<i>Mechanical Properties</i>	<i>Method</i>	<i>Specification</i>	<i>Value</i>
Peel Strength (1 oz) As received	IPC-TM-650 2.4.8	—	10-12 lb/in
After thermal stress	"	$>6 \text{ lb/in}$	9-12 lb/in
Flexural Strength Warp	IPC-TM-650 2.4.4	$>415 \text{ MPa}$	600 MPa
Fill	"	$>345 \text{ MPa}$	500 MPa

Note: Data shown are typical values for reference only.

## Storage

Store at around room temperature 18 to 27 °C [65 to 80 °F] and protect from direct heat or sunlight. Keep sealed in an air tight container, away from humidity.

## Health and Safety

Please see the *500 Series Copper Clad Boards Safety Data Sheet* (SDS) for more details on transportation, storage, handling and other security guidelines.

**Environmental Impact:** This product doesn't have any known environmental toxicity.



This product meets the European Directive 2011/65/EU Annex II (ROHS); recasting 2002/95/EC.

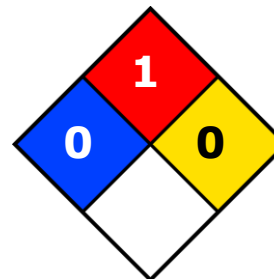
**Health and Safety:** This product is not considered to be hazardous for human health under normal use. It is widely used in the packing and food industry.



### HMIS® RATING

<b>HEALTH:</b>	<b>0</b>
<b>FLAMMABILITY:</b>	<b>1</b>
<b>PHYSICAL HAZARD:</b>	<b>0</b>
<b>PERSONAL PROTECTION:</b>	

### NFPA® 704 CODES



*Approximate HMIS and NFPA Risk Ratings Legend:*

0 (Low or none); 1 (Slight); 2 (Moderate); 3 (Serious); 4 (Severe)

## Packaging and Supporting Products

### 1 oz Copper Claddings

FR4 1/16" (1.60 mm), single sided

<i>Cat. No.</i>	<i>Metric</i>	<i>Imperial</i> <sup>a)</sup>
503	76 x 127 mm	3" x 5"
506	101 x 152 mm	4" x 6"
509	152 x 152 mm	6" x 6"
512	152 x 228 mm	6" x 9"
515	203 x 254 mm	8" x 10"
521	304 x 304 mm	12" x 12"
575	609 x 914 mm	24" x 36"
580	914 x 1219 mm	36" x 48"

FR4 1/16" (1.60 mm), double sided

<i>Cat. No.</i>	<i>Metric</i>	<i>Imperial</i> <sup>a)</sup>
540	76 x 127 mm	3" x 5"
550	152 x 152 mm	6" x 6"
555	304 x 304 mm	12" x 12"

FR4 1/32" (0.80 mm), single sided

<i>Cat. No.</i>	<i>Metric</i>	<i>Imperial</i> <sup>a)</sup>
586	101 x 152 mm	4" x 6"
588	152 x 228 mm	6" x 9"

FR4 1/32" (0.80 mm), double sided

<i>Cat. No.</i>	<i>Metric</i>	<i>Imperial</i> <sup>a)</sup>
587	101 x 152 mm	3" x 5"
589	152 x mm	4" x 6"

a) Sizes are approximate



ISO 9001 Registered Quality System.  
Burlington, Ontario, Canada QMI File # 004008

# Copper Clad Boards 500 Series Technical Data Sheet

500 Series

## 1/2 oz Copper Claddings

FR4 1/16" (1.60 mm), single sided

<i>Cat. No.</i>	<i>Metric</i>	<i>Imperial</i> <sup>a)</sup>
510	152 x 152 mm	6" x 6"
516	203 x 254 mm	8" x 10"

FR4 1/16" (1.60 mm), double sided

<i>Cat. No.</i>	<i>Metric</i>	<i>Imperial</i> <sup>a)</sup>
551	152 x 152 mm	6" x 6"

b) Sizes are approximate

## Supporting Products

- *Positive Presensitized Copper Clad Boards, 600 Series*

## Technical Support

Contact us regarding any questions, improvement suggestions, or problems with this product. Application notes, instructions, and FAQs are located at [www.mgchemicals.com](http://www.mgchemicals.com).

Email: [support@mgchemicals.com](mailto:support@mgchemicals.com)

Phone: +(1) 800-340-0772 (Canada, Mexico & USA)

+ (1) 905-331-1396 (International)

Fax: + (1) 905-331-2862 or + (1) 800-340-0773

Mailing address: **Manufacturing & Support**  
1210 Corporate Drive  
Burlington, Ontario, Canada  
L7L 5R6

**Head Office**  
9347-193rd Street  
Surrey, British Columbia, Canada  
V4N 4E7

## Warranty

*M.G. Chemicals Ltd.* warranties this product for 12 months from the date of purchase by the end user. *M.G. Chemicals Ltd.* makes no claims as to shelf life of this product for the warranty. The liability of *M.G. Chemicals Ltd.* whether based on its warranty, contracts, or otherwise shall in no case include incidental or consequential damage.

## Disclaimer

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