



浙江华正新材料股份有限公司

JIANG WAZAM NEW MATERIALS CO., LTD.

覆铜箔层压板检测报告及品质保证书

Copper Clad Laminate Quality Test Report And COC

订单号(P/O): **E230809**

物料号(P/N):

出货日期(D/D): **20230816**

型号(Type):	H140A 0.71mm H/H 1042*1245mm 黄色(YELLOW) FR-4.0 不含铜 Exc.0	客户(Customer):	LLC Electroconnect (人民币)
	H140A 0.028" H/H 41*49"	总数量(Total Qty):	100
箱号(P/N):	3000637583	3000637583	
批号(L/N):	23810PCK3002A	23810PBK3002A	
生产日期(M/D)	20230810	20230810	
有效日期(E/D)	20250809	20250809	

结构: 4*7628

No	检测项目 Item	单位Unit	检测条件 Test Condition	规范值 Specification Value	测试值 Actual Value
1	外观 Visuals	—	A IPC-TM-650 2.1.5 2.1.9	CLASS A IPC-4101 3.8.3.1	PASS
2	板厚 Thickness	mm mil	A IPC-TM-650 2.2.18	IPC-4101 3.8.4.2.4 ±0.050 ±2.0	0.709 -- 0.752 28.36 -- 30.08
3	尺寸公差 Panel Size Tolerance	mm	A IPC-TM-650 2.2.19.1	+2/-0 IPC-4101 3.8.4.1	1.0
4	方正度 Squareness	mm	A IPC-TM-650 2.2.19.1	≤3.0 IPC-4101 3.8.4.1	1.5
5	蚀刻特性 Etching Properties	—	A IPC-TM-650 2.1.5	无异常No Abnormalities IPC-4101 3.8.3.1.6	PASS
6	板弯曲 Bow&Twist	弓曲 Bow 扭曲 Twist	A IPC-TM-650 2.4.22.1	IPC-4101 3.8.4.3	≤1.0 0.32 ≤1.0 0.32
7	剥离强度 Peel Strength	上铜 Up 下铜 Down	N/mm 288°C*10s IPC-TM-650 2.4.8	IPC-4101 3.9.1.1	≥1.05 1.37 ≥1.05 1.28
8	尺寸稳定性 Dimensional Stability	经向 Warp 纬向 Fill	ppm Etched+E-2/150 IPC-TM-650 2.4.39	IPC-4101 3.9.1.2	NA NA NA NA
9	弯曲强度 Flexural Strength	经向 Warp 纬向 Fill	N/mm2 A IPC-TM-650 2.4.4	IPC-4101 3.9.1.3	≥415 589 ≥345 490
10	燃烧性 Flammability	—	C-24/23/50+ E-24/125+des-4 IPC-TM-650 2.3.10	UL94 V-0 IPC-4101 3.10.1.1	V-0
11	热应力 Thermal stress	S	E-2/125 IPC-TM-650 2.4.13.1	>10 IPC-4101 3.10.1.2	无分层、无起泡 No Delamination、No Blistering
12	玻璃转移点 Glass transition temperature	TG1 TG2 ΔTG	°C E-2/105 IPC-TM-650 2.4.25	IPC-4101 3.10.1.6 IPC-4101 3.10.1.7	≥130 132.40 ≥130 133.82 ≤3 -1.42
13	介电常数(DK)(1MHZ) Dielectric Constant	—	C-24/23/50 IPC-TM-650 2.5.5.2	≤5.4 IPC-4101 3.11.1.1	4.59
14	介电损耗角正切(DF)(1MHZ) Loss Tangent	—	C-24/23/50 IPC-TM-650 2.5.5.2	≤0.035 IPC-4101 3.11.1.2	0.023
15	体积电阻(RV) Volume Resistivity	MΩ cm	C-96/35/90+E-24/125 IPC-TM-650 2.5.17.1	≥1.0×10 ⁶ IPC-4101 3.11.1.3	6.92*10 ⁸
16	表面电阻(RS) Surface Resistivity	MΩ	C-96/35/90+E-24/125 IPC-TM-650 2.5.17.1	≥1.0×10 ⁴ IPC-4101 3.11.1.4	6.37*10 ⁶
17	耐电弧性 Arc Resistance	S	D-48/50+D-0.5/23 IPC-TM-650 2.5.1	≥60 IPC-4101 3.11.1.5	126
18	击穿电压 Dielectric Breakdown	KV	D-48/50+D-0.5/23 IPC-TM-650 2.5.6	≥40 IPC-4101 3.11.1.6	50
19	电气强度 Dielectric Strength	KV/mm	D-48/50+D-0.5/23 IPC-TM-650 2.5.6.2	≥30 IPC-4101 3.11.1.7	44
20	相对漏电指数CTI Comparative Tracking Index	V	IEC-60112	175≤CTI<400 GB/T4207-2003	225
21	吸水性 Moisture Absorption	%	E-1/105+des+D-24/23 IPC-TM-650 2.6.2.1	≤0.8 IPC-4101 3.12.1.1	0.14
22	完善性 Pressure Vessel	S	PCT 120°C*1h IPC-TM-650 2.6.16	>10 IPC-4101 3.12.1.3	无分层、无起泡 No Delamination、No Blistering

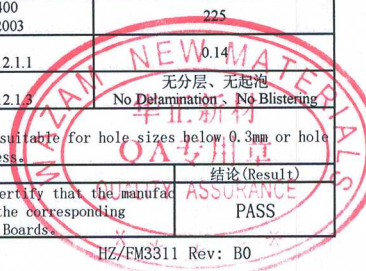
Note 1). 上述板材符合欧盟RoHS指令。The above laminate(s) is accord with RoHS directive.
 2). 本材料不适用于0.3mm以下孔径或0.35mm以下孔间距及对CAF有要求的制程。The material is not suitable for hole sizes below 0.3mm or hole to wall spacing below 0.35mm process. It is also not suitable for CAF requirements process.

兹证明以上所列制成品符合订单所述要求, 并符合IPC-4101刚性及多层印制板材料规格相应要求。This is to certify that the manufacture products listed above conform to the requirements specified in your Purchase Order and fulfill the corresponding requirements of the IPC-4101 Specification for Basic Materials for Rigid and Multilayer Printed Boards.

检测 (Test): 件小姐

审核 (Check): 谢青松

HZ/FM3311 Rev: B0





浙江华正新材料股份有限公司

JIANG WAZAM NEW MATERIALS CO., LTD.

覆铜箔层压板检测报告及品质保证书

Copper Clad Laminate Quality Test Report And COC

订单号(P/O): E230809

物料号(P/N):

出货日期(D/D): 20230816

型号(Type):	H140A 2.0mm 1/1 1042*1245mm 黄色(YELLOW) FR-4.0 含铜 Inc. Cu	客户(Customer):	LLC Electroconnect (人民币)
	H140A 0.079" 1/1 41*49" S	总数量(Total Qty):	400
箱号(P/N):	3000637620	3000637620	3000637642
批号(L/N):	23810PAH3010A	23811PBK3001A	23811PBH3001A
生产日期(M/D):	20230810	20230811	20230811
有效日期(E/D):	20250809	20250810	20250810

结构: 11 *7628

No	检测项目 Item	单位 Unit	检测条件 Test Condition	规范值 Specification Value	测试值 Actual Value
1	外观 Visuals	—	A IPC-TM-650 2.1.5 2.1.9	CLASS A IPC-4101 3.8.3.1	PASS
2	板厚 Thickness	mm mil	A IPC-TM-650 2.2.18	IPC-4101 3.8.4.2.4 ±0.180 ±7.0	1.863 -- 2.041 74.52 -- 81.64
3	尺寸公差 Panel Size Tolerance	mm	A IPC-TM-650 2.2.19.1	+2/-0 IPC-4101 3.8.4.1	1.0
4	方正度 Squareness	mm	A IPC-TM-650 2.2.19.1	≤3.0 IPC-4101 3.8.4.1	1.5
5	蚀刻特性 Etching Properties	—	A IPC-TM-650 2.1.5	无异常 No Abnormalities IPC-4101 3.8.3.1.6	PASS
6	板弯曲 Bow/Twist	%	A IPC-TM-650 2.4.22.1	IPC-4101 3.8.4.3	≤0.75 0.17 ≤0.75 0.26
7	剥离强度 Peel Strength	N/mm	288°C*10s IPC-TM-650 2.4.8	IPC-4101 3.9.1.1	≥1.40 1.75 ≥1.40 1.74
8	尺寸稳定性 Dimensional Stability	ppm	Etched+E-2/150 IPC-TM-650 2.4.39	IPC-4101 3.9.1.2	NA NA NA NA
9	弯曲强度 Flexural Strength	N/mm ²	A IPC-TM-650 2.4.4	IPC-4101 3.9.1.3	≥415 598 ≥345 490
10	燃烧性 Flammability	—	C-24/23/50+ E-24/125+des-4 IPC-TM-650 2.3.10	UL94 V-0 IPC-4101 3.10.1.1	V-0
11	热应力 Thermal stress	S	E-2/125 IPC-TM-650 2.4.13.1	>10 IPC-4101 3.10.1.2	无分层、无起泡 No Delamination、No Blistering
12	玻璃转移点 Glass transition temperature	°C	E-2/105 IPC-TM-650 2.4.25	IPC-4101 3.10.1.6 IPC-4101 3.10.1.7	≥130 132.45 ≥130 133.58 ≤3 -1.13
13	介电常数 (DK) (1MHZ) Dielectric Constant	—	C-24/23/50 IPC-TM-650 2.5.5.2	≤5.4 IPC-4101 3.11.1.1	4.59
14	介电损耗角正切 (DF) (1MHZ) Loss Tangent	—	C-24/23/50 IPC-TM-650 2.5.5.2	≤0.035 IPC-4101 3.11.1.2	0.025
15	体积电阻 (RV) Volume Resistivity	MΩ cm	C-96/35/90+E-24/125 IPC-TM-650 2.5.17.1	≥1.0*10 ⁶ IPC-4101 3.11.1.3	5.01*10 ⁸
16	表面电阻 (RS) Surface Resistivity	MΩ	C-96/35/90+E-24/125 IPC-TM-650 2.5.17.1	≥1.0*10 ⁴ IPC-4101 3.11.1.4	6.20*10 ⁶
17	耐电弧性 Arc Resistance	S	D-48/50+D-0.5/23 IPC-TM-650 2.5.1	≥60 IPC-4101 3.11.1.5	131
18	击穿电压 Dielectric Breakdown	KV	D-48/50+D-0.5/23 IPC-TM-650 2.5.6	≥40 IPC-4101 3.11.1.6	50
19	电气强度 Dielectric Strength	KV/mm	D-48/50+D-0.5/23 IPC-TM-650 2.5.6.2	≥30 IPC-4101 3.11.1.7	46
20	相对漏电指数CTI Comparative Tracking Index	V	IEC-60112	175≤CTI<400 GB/T4207-2003	200
21	吸水性 Moisture Absorption	%	E-1/105+des+D-24/23 IPC-TM-650 2.6.2.1	≤0.8 IPC-4101 3.12.1.1	0.20
22	完善性 Pressure Vessel	S	PCT 120°C*1h IPC-TM-650 2.6.16	>10 IPC-4101 3.12.1.3	无分层、无起泡 No Delamination、No Blistering

Note 1). 上述板材符合欧盟RoHS指令。The above laminate(s) is accord with RoHS directive.
 2). 本材料不适用于0.3mm以下孔径或0.35mm以下孔间距及对CAF有要求的制程。The material is not suitable for hole sizes below 0.3mm or hole to wall spacing below 0.35mm process. It is also not suitable for CAF requirements process.

证明 CERTIFICATE OF CONFORMANCE
 兹证明以上所列制成品符合订单所述要求, 并符合IPC-4101刚性及多层印制板材料规格相应要求。This is to certify that the manufac products listed above conform to the requirements specified in your Purchase Order and fulfill the corresponding requirements for the IPC-4101 Specification for Basic Materials for Rigid and Multilayer Printed Boards.

检测 (Test): 牛小娟

审核 (Check): 谢观松

HZ/FM3311 Rev: B0

结论 (Result)

PASS

WAZAM
华正新材



浙江华正新材料股份有限公司
JIANG WAZAM NEW MATERIALS CO., LTD.
覆铜箔层压板检测报告及品质保证书

Copper Clad Laminate Quality Test Report And COC

订单号(P/O): E230809 物料号(P/N): 客户(Customer): LLC Electroconnect (人民币) 出货日期(D/D): 20230816

型号(Type):	H140A 1.0mm 1/1 1042*1245mm 黄色(YELLOW) FR-4.0 含铜 Inc. Cu		客户(Customer):	LLC Electroconnect (人民币)	
	H140A 0.039" 1/1 41*49" S		总数量(Total Qty):	200	
箱号(P/N):	3000637584	3000637584			
批号(L/N):	23810PCH3006A	23810PCK3009A			
生产日期(M/D)	20230810	20230810			
有效日期(E/D)	20250809	20250809			

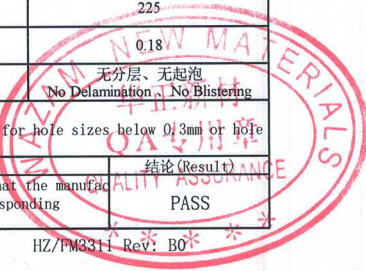
结构: 5*7628

No	检测项目 Item	单位Unit	检测条件 Test Condition	规范值 Specification Value	测试值 Actual Value
1	外观 Visuals	—	A IPC-TM-650 2.1.5 2.1.9	CLASS A IPC-4101 3.8.3.1	PASS
2	板厚 Thickness	mm mil	A IPC-TM-650 2.2.18	IPC-4101 3.8.4.2.4 ±0.100 ±4.0	0.921 -- 1.031 36.84 -- 41.24
3	尺寸公差 Panel Size Tolerance	mm	A IPC-TM-650 2.2.19.1	+2/0 IPC-4101 3.8.4.1	1.0
4	方正度 Squareness	mm	A IPC-TM-650 2.2.19.1	≤3.0 IPC-4101 3.8.4.1	1.5
5	蚀刻特性 Etching Properties	—	A IPC-TM-650 2.1.5	无异常No Abnormalities IPC-4101 3.8.3.1.6	PASS
6	板弯曲 Bow&Twist	弓曲 Bow 扭曲 Twist	A IPC-TM-650 2.4.22.1	IPC-4101 3.8.4.3	≤0.75 0.13
7	剥离强度 Peel Strength	上铜 Up 下铜 Down	288°C*10s IPC-TM-650 2.4.8	IPC-4101 3.9.1.1	≥1.40 1.79 ≥1.40 1.74
8	尺寸稳定性 Dimensional Stability	纵向 Warp 纵向 Fill	Etched+E-2/150 IPC-TM-650 2.4.39	IPC-4101 3.9.1.2	NA NA
9	弯曲强度 Flexural Strength	纵向 Warp 纵向 Fill	A IPC-TM-650 2.4.4	IPC-4101 3.9.1.3	≥415 589 ≥345 490
10	燃烧性 Flammability	—	C-24/23/50+ E-24/125+des-4 IPC-TM-650 2.3.10	UL94 V-0 IPC-4101 3.10.1.1	V-0
11	热应力 Thermal stress	S	E-2/125 IPC-TM-650 2.4.13.1	>10 IPC-4101 3.10.1.2	无分层、无起泡 No Delamination、No Blistering
12	玻璃转移点 Glass transition temperature	TG1 TG2 ΔTG	E-2/105 IPC-TM-650 2.4.25	IPC-4101 3.10.1.6 IPC-4101 3.10.1.7	≥130 133.29 ≥130 132.49 ≤3 0.8
13	介电常数(DK)(1MHZ) Dielectric Constant	—	C-24/23/50 IPC-TM-650 2.5.5.2	≤5.4 IPC-4101 3.11.1.1	4.64
14	介质损耗角正切(DF)(1MHZ) Loss Tangent	—	C-24/23/50 IPC-TM-650 2.5.5.2	≤0.035 IPC-4101 3.11.1.2	0.021
15	体积电阻(RV) Volume Resistivity	MΩ·cm	C-96/35/90+E-24/125 IPC-TM-650 2.5.17.1	≥1.0×10 ⁶ IPC-4101 3.11.1.3	6.77*10 ⁸
16	表面电阻(RS) Surface Resistivity	MΩ	C-96/35/90+E-24/125 IPC-TM-650 2.5.17.1	≥1.0×10 ⁴ IPC-4101 3.11.1.4	4.92*10 ⁶
17	耐电弧性 Arc Resistance	S	D-48/50+D-0.5/23 IPC-TM-650 2.5.1	≥60 IPC-4101 3.11.1.5	125
18	击穿电压 Dielectric Breakdown	KV	D-48/50+D-0.5/23 IPC-TM-650 2.5.6	≥40 IPC-4101 3.11.1.6	54
19	电气强度 Dielectric Strength	KV/mm	D-48/50+D-0.5/23 IPC-TM-650 2.5.6.2	≥30 IPC-4101 3.11.1.7	48
20	相对漏电指数CTI Comparative Tracking Index	V	IEC-60112	175≤CTI<400 GB/T4207-2003	225
21	吸水性 Moisture Absorption	%	E-1/105+des+D-24/23 IPC-TM-650 2.6.2.1	≤0.8 IPC-4101 3.12.1.1	0.18
22	完善性 Pressure Vessel	S	PCT 120°C*1h IPC-TM-650 2.6.16	>10 IPC-4101 3.12.1.3	无分层、无起泡 No Delamination、No Blistering

Note 1). 上述板材符合欧盟RoHS指令。The above laminate(s) is accord with RoHS directive.
2). 本材料不适用于0.3mm以下孔径或0.35mm以下孔间距及对CAF有要求的制程。The material is not suitable for hole sizes below 0.3mm or hole to wall spacing below 0.35mm process. It is also not suitable for CAF requirements process.

证明 CERTIFICATE OF CONFORMANCE
兹证明以上所列制成成品符合订单所述要求, 并符合IPC-4101刚性及多层印制板基材规格相应要求。This is to certify that the manufactured products listed above conform to the requirements specified in your Purchase Order and fulfill the corresponding requirements of the IPC-4101 Specification for Basic Materials for Rigid and Multilayer Printed Boards.
结论(Result)
PASS

检测(Tes): 牛小娟 审核(Check): 谢观松 HZ/PM311 Rev: B0





浙江华正新材料股份有限公司

JIANG WAZAM NEW MATERIALS CO., LTD.

覆铜箔层压板检测报告及品质保证书

Copper Clad Laminate Quality Test Report And COC

订单号(P/O): E230809

物料号(P/N):

出货日期(D/D): 20230816

型号(Type):	H140A 1.5mm H/H 1042*1245mm 黄色(YELLOW) FR-4.0 含铜 Inc. Cu			客户(Customer):	LLC Electroconnect (人民币)
箱号(P/N):	3000637585	3000637504	3000637498	总数量(Total Qty):	900
批号(L/N):	23810PCK3005A	23810PCH3003A	23810PCK3007A	23810PCH3003A	
生产日期(M/D):	20230810	20230810	20230810	20230810	
有效日期(E/D):	20250809	20250809	20250809	20250809	

结构: 8*7628

No	检测项目 Item	单位 Unit	检测条件 Test Condition	规范值 Specification Value	测试值 Actual Value
1	外观 Visuals	—	A IPC-TM-650 2.1.5 2.1.9	CLASS A IPC-4101 3.8.3.1	PASS
2	板厚 Thickness	mm mil	A IPC-TM-650 2.2.18	IPC-4101 3.8.4.2.4 ±0.130 ±5.0	1.410 56.40 -- 1.519 -- 60.76
3	尺寸公差 Panel Size Tolerance	mm	A IPC-TM-650 2.2.19.1	+2/-0 IPC-4101 3.8.4.1	1.0
4	方正度 Squareness	mm	A IPC-TM-650 2.2.19.1	≤3.0 IPC-4101 3.8.4.1	1.5
5	蚀刻特性 Etching Properties	—	A IPC-TM-650 2.1.5	无异常 No Abnormalities IPC-4101 3.8.3.1.6	PASS
6	板弯翘 Bow & Twist	%	A IPC-TM-650 2.4.22.1	IPC-4101 3.8.4.3	≤0.75 0.22
7	剥离强度 Peel Strength	N/mm	288°C*10s IPC-TM-650 2.4.8	IPC-4101 3.9.1.1	≥1.05 1.35
8	尺寸稳定性 Dimensional Stability	ppm	Etched+E-2/150 IPC-TM-650 2.4.39	IPC-4101 3.9.1.2	NA NA
9	弯曲强度 Flexural Strength	N/mm ²	A IPC-TM-650 2.4.4	IPC-4101 3.9.1.3	≥415 573 ≥345 466
10	燃烧性 Flammability	—	C-24/23/50+ E-24/125+des-4 IPC-TM-650 2.3.10	UL94 V-0 IPC-4101 3.10.1.1	V-0
11	热应力 Thermal stress	S	E-2/125 IPC-TM-650 2.4.13.1	>10 IPC-4101 3.10.1.2	无分层、无起泡 No Delamination, No Blistering
12	玻璃转移点 Glass transition temperature	°C	E-2/105 IPC-TM-650 2.4.25	IPC-4101 3.10.1.6 IPC-4101 3.10.1.7	≥130 ≥130 ≤3 132.16 132.93 -0.77
13	介电常数(DK)(1MHZ) Dielectric Constant	—	C-24/23/50 IPC-TM-650 2.5.5.2	≤5.4 IPC-4101 3.11.1.1	4.64
14	介质损耗角正切(DP)(1MHZ) Loss Tangent	—	C-24/23/50 IPC-TM-650 2.5.5.2	≤0.035 IPC-4101 3.11.1.2	0.022
15	体积电阻(RV) Volume Resistivity	MΩ·cm	C-96/35/90+E-24/125 IPC-TM-650 2.5.17.1	≥1.0×10 ⁶ IPC-4101 3.11.1.3	2.00*10 ⁸
16	表面电阻(RS) Surface Resistivity	MΩ	C-96/35/90+E-24/125 IPC-TM-650 2.5.17.1	≥1.0×10 ⁴ IPC-4101 3.11.1.4	5.58*10 ⁶
17	耐电弧性 Arc Resistance	S	D-48/50+D-0.5/23 IPC-TM-650 2.5.1	≥60 IPC-4101 3.11.1.5	131
18	击穿电压 Dielectric Breakdown	KV	D-48/50+D-0.5/23 IPC-TM-650 2.5.6	≥40 IPC-4101 3.11.1.6	51
19	电气强度 Dielectric Strength	KV/mm	D-48/50+D-0.5/23 IPC-TM-650 2.5.6.2	≥30 IPC-4101 3.11.1.7	45
20	相对漏电指数CTI Comparative Tracking Index	V	IEC-60112	175≤CTI<400 GB/T4207-2003	200
21	吸水性 Moisture Absorption	%	E-1/105+des+D-24/23 IPC-TM-650 2.6.2.1	≤0.8 IPC-4101 3.12.1.1	0.23
22	完善性 Pressure Vessel	S	PCT 120°C*1h IPC-TM-650 2.6.16	>10 IPC-4101 3.12.1.3	无分层、无起泡 No Delamination, No Blistering

Note 1). 上述板材符合欧盟RoHS指令。The above laminate(s) is accord with RoHS directive.
 2). 本材料不适用于0.3mm以下孔径或0.35mm以下孔间距及对CAF有要求的制程。The material is not suitable for hole sizes below 0.3mm or hole to wall spacing below 0.35mm process. It is also not suitable for CAF requirements process.

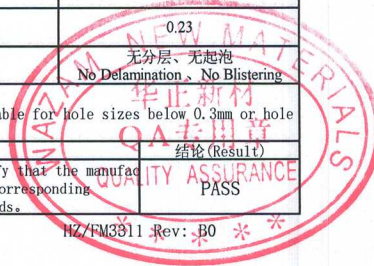
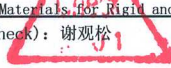
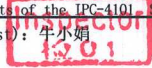
证明 CERTIFICATE OF CONFORMANCE

兹证明以上所列制成品符合订单所述要求, 并符合IPC-4101刚性及多层印制板基材规格相应要求。This is to certify that the manufac products listed above conform to the requirements specified in your Purchase Order and fulfill the corresponding requirements of the IPC-4101. Specification for Basic Materials for Rigid and Multilayer Printed Boards.

检测(Tes): 牛小娟

审核(Check): 谢观松

HZ/FM3811 Rev: B0





浙江华正新材料股份有限公司

JIANG WAZAM NEW MATERIALS CO., LTD.

覆铜箔层压板检测报告及品质保证书

Copper Clad Laminate Quality Test Report And COC

订单号(P/O): E230809

物料号(P/N):

出货日期(D/D): 20230816

型号(Type):	H140A 1.5mm 1/1 1042*1245mm 黄色(YELLOW) FR-4.0 含铜 Inc. Cu			客户(Customer):	LLC Electroconnect (人民币)	
	H140A 0.059" 1/1 41*49" S			总数量(Total Qty):	900	
箱号(P/N):	3000637586	3000637586	3000637606	3000637606	3000637596	3000637596
批号(L/N):	23810PAH3008A	23810PAK3010A	23810PAH3009A	23810PAK3011A	23810PAH3008A	23810PAK3011A
生产日期(M/D):	20230810	20230810	20230810	20230810	20230810	20230810
有效日期(E/D):	20250809	20250809	20250809	20250809	20250809	20250809

结构: 8*7628

No	检测项目 Item	单位 Unit	检测条件 Test Condition	规范值 Specification Value	测试值 Actual Value
1	外观 Visuals	—	A IPC-TM-650 2.1.5 2.1.9	CLASS A IPC-4101 3.8.3.1	PASS
2	板厚 Thickness	mm mil	A IPC-TM-650 2.2.18	IPC-4101 3.8.4.2.4 ±0.130 ±5.0	1.418 56.72 -- 1.521 -- 60.84
3	尺寸公差 Panel Size Tolerance	mm	A IPC-TM-650 2.2.19.1	+2/-0 IPC-4101 3.8.4.1	1.0
4	方正度 Squareness	mm	A IPC-TM-650 2.2.19.1	≤3.0 IPC-4101 3.8.4.1	1.5
5	蚀刻特性 Etching Properties	—	A IPC-TM-650 2.1.5	无异常 No Abnormalities IPC-4101 3.8.3.1.6	PASS
6	板弯翘 Bow/Twist	弓曲 Bow 扭曲 Twist	A IPC-TM-650 2.4.22.1	IPC-4101 3.8.4.3	≤0.75 0.17 ≤0.75 0.11
7	剥离强度 Peel Strength	上铜 Up 下铜 Down	N/mm 288°C*10s IPC-TM-650 2.4.8	IPC-4101 3.9.1.1	≥1.40 1.76 ≥1.40 1.80
8	尺寸稳定性 Dimensional Stability	经向 Warp 纬向 Fill	ppm Etched+E-2/150 IPC-TM-650 2.4.39	IPC-4101 3.9.1.2	NA NA NA NA
9	弯曲强度 Flexural Strength	经向 Warp 纬向 Fill	N/mm2 A IPC-TM-650 2.4.4	IPC-4101 3.9.1.3	≥415 589 ≥345 490
10	燃烧性 Flammability	—	C-24/23/50+ E-24/125+des-4 IPC-TM-650 2.3.10	UL94 V-0 IPC-4101 3.10.1.1	V-0
11	热应力 Thermal stress	S	E-2/125 IPC-TM-650 2.4.13.1	>10 IPC-4101 3.10.1.2	无分层、无起泡 No Delamination、No Blistering
12	玻璃转移点 Glass transition temperature	TG1 TG2 ΔTG	°C E-2/105 IPC-TM-650 2.4.25	IPC-4101 3.10.1.6 IPC-4101 3.10.1.7	≥130 132.89 ≥130 133.45 ≤3 -0.56
13	介电常数(DK) (1MHZ) Dielectric Constant	—	C-24/23/50 IPC-TM-650 2.5.5.2	≤5.4 IPC-4101 3.11.1.1	4.54
14	介质损耗角正切 (DF) (1MHZ) Loss Tangent	—	C-24/23/50 IPC-TM-650 2.5.5.2	≤0.035 IPC-4101 3.11.1.2	0.023
15	体积电阻(RV) Volume Resistivity	MΩ cm	C-96/35/90+E-24/125 IPC-TM-650 2.5.17.1	≥1.0*10 ⁶ IPC-4101 3.11.1.3	4.28*10 ⁸
16	表面电阻(RS) Surface Resistivity	MΩ	C-96/35/90+E-24/125 IPC-TM-650 2.5.17.1	≥1.0*10 ⁴ IPC-4101 3.11.1.4	1.66*10 ⁶
17	耐电弧性 Arc Resistance	S	D-48/50+D-0.5/23 IPC-TM-650 2.5.1	≥60 IPC-4101 3.11.1.5	122
18	击穿电压 Dielectric Breakdown	KV	D-48/50+D-0.5/23 IPC-TM-650 2.5.6	≥40 IPC-4101 3.11.1.6	54
19	电气强度 Dielectric Strength	KV/mm	D-48/50+D-0.5/23 IPC-TM-650 2.5.6.2	≥30 IPC-4101 3.11.1.7	49
20	相对漏电指数CTI Comparative Tracking Index	V	IEC-60112	175≤CTI<400 GB/T4207-2003	225
21	吸水性 Moisture Absorption	%	E-1/105+des+D-24/23 IPC-TM-650 2.6.2.1	≤0.8 IPC-4101 3.12.1.1	0.13
22	完善性 Pressure Vessel	S	PCT 120°C*1h IPC-TM-650 2.6.16	>10 IPC-4101 3.12.1.3	无分层、无起泡 No Delamination、No Blistering

Note 1). 上述板材符合欧盟RoHS指令。The above laminate(s) is accord with RoHS directive.
 2). 本材料不适用于0.3mm以下孔径或0.35mm以下孔间距及对CAF有要求的制程。The material is not suitable for hole sizes below 0.3mm or hole to wall spacing below 0.35mm process. It is also not suitable for CAF requirements process.

证明 CERTIFICATE OF CONFORMANCE
 兹证明以上所列制成品符合订单所述要求,并符合IPC-4101刚性及多层印制板基材规格相应要求。This is to certify that the manufac products listed above conform to the requirements specified in your Purchase Order and fulfill the corresponding requirements of the IPC-4101 Specification for Basic Materials for Rigid and Multilayer Printed Boards.

检测 (Test): 华小娟

审核 (Check): 谢观松

HZ/PM3311 Rev: B0

结论 (Result):

PASS



覆铜箔层压板检测报告及品质保证书

Copper Clad Laminate Quality Test Report And COC

订单号(P/O): E230809 物料号(P/N): 出货日期(D/D): 20230816

型号(Type):	H140A 2.0mm 3/3 1042*1245mm 黄色(YELLOW) FR-4.0 含铜 Inc. Cu	客户(Customer):	LLC Electroconnect (人民币)
	H140A 0.079" 3/3 41*49" S	总数量(Total Qty):	100
箱号(P/N):	1358153		
批号(L/N):	23810PBB1003A		
数量(Qty)	100		
生产日期(M/D):	20230810		
有效日期(E/D):	20250809		

结构: 10 *7628

No	检测项目 Item	单位Unit	检测条件 Test Condition	规范值 Specification Value	测试值 Actual Value
1	外观 Visuals	—	A IPC-TM-650 2.1.5 2.1.9	CLASS A IPC-4101 3.8.3.1	PASS
2	板厚 Thickness	mm mil	A IPC-TM-650 2.2.18	IPC-4101 3.8.4.2.4 ±0.180 ±7.0	1.868 -- 2.029 74.72 -- 81.16
3	尺寸公差 Panel Size Tolerance	mm	A IPC-TM-650 2.2.19.1	+2/-0 IPC-4101 3.8.4.1	1.0
4	方正度 Squareness	mm	A IPC-TM-650 2.2.19.1	≤3.0 IPC-4101 3.8.4.1	1.0
5	蚀刻特性 Etching Properties	—	A IPC-TM-650 2.1.5	无异常No Abnormalities IPC-4101 3.8.3.1.6	PASS
6	板弯翘 Bow&Twist	弓曲 Bow 扭曲 Twist	A IPC-TM-650 2.4.22.1	IPC-4101 3.8.4.3	≤0.75 0.12 ≤0.75 0.21
7	剥离强度 Peel Strength	上铜 Up 下铜 Down	288°C*10s IPC-TM-650 2.4.8	IPC-4101 3.9.1.1	≥2.10 2.58 ≥2.10 2.55
8	尺寸稳定性 Dimensional Stability	经向 Warp 纬向 Fill	Etched+E-2/150 IPC-TM-650 2.4.39	IPC-4101 3.9.1.2	NA NA NA NA
9	弯曲强度 Flexural Strength	经向 Warp 纬向 Fill	A IPC-TM-650 2.4.4	IPC-4101 3.9.1.3	≥415 593 ≥345 493
10	燃烧性 Flammability	—	C-24/23/50+ E-24/125+des-4 IPC-TM-650 2.3.10	UL94 V-0 IPC-4101 3.10.1.1	V-0
11	热应力 Thermal stress	S	E-2/125 IPC-TM-650 2.4.13.1	>10 IPC-4101 3.10.1.2	无分层、无起泡 No Delamination、No Blistering
12	玻璃转移点 Glass transition temperature	TG1 TG2 ΔTG	E-2/105 IPC-TM-650 2.4.25	IPC-4101 3.10.1.6 IPC-4101 3.10.1.7	≥130 133.13 ≥130 133.11 ≤3 0.02
13	介电常数(DK)(1MHZ) Dielectric Constant	—	C-24/23/50 IPC-TM-650 2.5.5.2	≤5.4 IPC-4101 3.11.1.1	4.64
14	介质损耗角正切(DF)(1MHZ) Loss Tangent	—	C-24/23/50 IPC-TM-650 2.5.5.2	≤0.035 IPC-4101 3.11.1.2	0.020
15	体积电阻(RV) Volume Resistivity	MΩ·cm	C-96/35/90+E-24/125 IPC-TM-650 2.5.17.1	≥1.0×10 ⁶ IPC-4101 3.11.1.3	3.37*10 ⁸
16	表面电阻(RS) Surface Resistivity	MΩ	C-96/35/90+E-24/125 IPC-TM-650 2.5.17.1	≥1.0×10 ⁴ IPC-4101 3.11.1.4	2.58*10 ⁶
17	耐电弧性 Arc Resistance	S	D-48/50+D-0.5/23 IPC-TM-650 2.5.1	≥60 IPC-4101 3.11.1.5	133
18	击穿电压 Dielectric Breakdown	KV	D-48/50+D-0.5/23 IPC-TM-650 2.5.6	≥40 IPC-4101 3.11.1.6	58
19	电气强度 Dielectric Strength	KV/mm	D-48/50+D-0.5/23 IPC-TM-650 2.5.6.2	≥30 IPC-4101 3.11.1.7	47
20	相对漏电指数CTI Comparative Tracking Index	V	IEC-60112	175≤CTI<400 GB/T4207-2003	225
21	吸水性 Moisture Absorption	%	E-1/105+des+D-24/23 IPC-TM-650 2.6.2.1	≤0.8 IPC-4101 3.12.1.1	0.14
22	完善性 Pressure Vessel	S	PCT 120°C*1h IPC-TM-650 2.6.16	>10 IPC-4101 3.12.1.3	无分层、无起泡 No Delamination、No Blistering
Note	1). 上述板材符合欧盟RoHS指令。The above laminate(s) is accord with RoHS directive. 2). 本材料不适用于0.3mm以下孔径或0.35mm以下孔间距及对CAF有要求的制程。The material is not suitable for hole sizes below 0.3mm or hole wall to wall spacing below 0.35mm process. It is also not suitable for CAF requirements process.				
证明 CERTIFICATE OF CONFORMANCE					结论(Result)
兹证明以上所列制成品符合订单所述要求, 并符合IPC-4101刚性及多层印制板基材规格相应要求。This is to certify that the manufactured products listed above conform to the requirements specified in your Purchase Order and fulfill the corresponding requirements of IPC-4101 Specification for Basic Materials for Rigid and Multilayer Printed Boards.					PASS

检测 (Test): 牛小娟 01

审核 (Check): 谢观松

HZ/FM3311 Rev: B0





浙江华正新材料股份有限公司

ZHEJIANG WAZAM NEW MATERIALS CO., LTD.

覆铜箔层压板检测报告及品质保证书

Copper Clad Laminate Quality Test Report And COC

订单号(P/O):

物料号(P/N):

出货日期(D/D): 20230816

型号 (Type):	H140A 1.0mm H/H 1042*1245mm 黄色(YELLOW) FR-4.0 含铜 Inc. Cu	客户 (Customer):	LLC Electroconnect (人民币)
	H140A 0.039" H/H 41*49" S	总数量 (Total Qty):	100
箱号 (P/N):	1358162		
批号 (L/N):	23813PAC1002A		
数量 (Qty):	100		
生产日期 (M/D):	20230813		
有效日期 (E/D):	20250812		

结构: 5*7628

No	检测项目 Item	单位 Unit	检测条件 Test Condition	规范值 Specification Value	测试值 Actual Value
1	外观 Visuals	—	A IPC-TM-650 2.1.5 2.1.9	CLASS A IPC-4101 3.8.3.1	PASS
2	板厚 Thickness	mm mil	A IPC-TM-650 2.2.18	IPC-4101 3.8.4.2.4 ±0.100 ±4.0	0.928 -- 1.012 37.12 -- 40.48
3	尺寸公差 Panel Size Tolerance	mm	A IPC-TM-650 2.2.19.1	+2/-0 IPC-4101 3.8.4.1	1.0
4	方正度 Squareness	mm	A IPC-TM-650 2.2.19.1	≤3.0 IPC-4101 3.8.4.1	1.5
5	蚀刻特性 Etching Properties	—	A IPC-TM-650 2.1.5	无异常 No Abnormalities IPC-4101 3.8.3.1.6	PASS
6	板弯翘 Bow & Twist	弓曲 Bow 扭曲 Twist	A IPC-TM-650 2.4.22.1	IPC-4101 3.8.4.3	≤0.75 0.11
7	剥离强度 Peel Strength	上铜 Up 下铜 Down	288°C*10s IPC-TM-650 2.4.8	IPC-4101 3.9.1.1	≥1.05 1.32
8	尺寸稳定性 Dimensional Stability	经向 Warp 纬向 Fill	Etched+E-2/150 IPC-TM-650 2.4.39	IPC-4101 3.9.1.2	NA NA
9	弯曲强度 Flexural Strength	经向 Warp 纬向 Fill	A IPC-TM-650 2.4.4	IPC-4101 3.9.1.3	≥415 602 ≥345 483
10	燃烧性 Flammability	—	C-24/23/50+ E-24/125+des-4 IPC-TM-650 2.3.10	UL94 V-0 IPC-4101 3.10.1.1	V-0
11	热应力 Thermal stress	S	E-2/125 IPC-TM-650 2.4.13.1	>10 IPC-4101 3.10.1.2	无分层、无起泡 No Delamination, No Blistering
12	玻璃转移点 Glass transition temperature	TG1 TG2 ΔTG	E-2/105 IPC-TM-650 2.4.25	IPC-4101 3.10.1.6 IPC-4101 3.10.1.7	≥130 ≥130 -0.09
13	介电常数 (DK) (1MHZ) Dielectric Constant	—	C-24/23/50 IPC-TM-650 2.5.5.2	≤5.4 IPC-4101 3.11.1.1	4.54
14	介质损耗角正切 (DF) (1MHZ) Loss Tangent	—	C-24/23/50 IPC-TM-650 2.5.5.2	≤0.035 IPC-4101 3.11.1.2	0.020
15	体积电阻 (RV) Volume Resistivity	MΩ·cm	C-96/35/90+E-24/125 IPC-TM-650 2.5.17.1	≥1.0×10 ⁶ IPC-4101 3.11.1.3	2.97*10 ⁸
16	表面电阻 (RS) Surface Resistivity	MΩ	C-96/35/90+E-24/125 IPC-TM-650 2.5.17.1	≥1.0×10 ⁴ IPC-4101 3.11.1.4	5.47*10 ⁶
17	耐电弧性 Arc Resistance	S	D-48/50+D-0.5/23 IPC-TM-650 2.5.1	≥60 IPC-4101 3.11.1.5	125
18	击穿电压 Dielectric Beakdown	KV	D-48/50+D-0.5/23 IPC-TM-650 2.5.6	≥40 IPC-4101 3.11.1.6	59
19	电气强度 Dielectric Strength	KV/mm	D-48/50+D-0.5/23 IPC-TM-650 2.5.6.2	≥30 IPC-4101 3.11.1.7	38
20	相对漏电指数CTI Comparative Tracking Index	V	IEC-60112	175≤CTI<400 GB/T4207-2003	225
21	吸水性 Moisture Absorption	%	E-1/105+des+D-24/23 IPC-TM-650 2.6.2.1	≤0.8 IPC-4101 3.12.1.1	0.22
22	完善性 Pressure Vessel	S	PCT 120°C*1h IPC-TM-650 2.6.16	>10 IPC-4101 3.12.1.3	无分层、无起泡 No Delamination, No Blistering
Note	1). 上述板材符合欧盟RoHS指令。The above laminate(s) is accord with RoHS directive. 2). 本材料不适用于0.3mm以下孔径或0.35mm以下孔间距及对CAF有要求的制程。The material is not suitable for hole sizes below 0.3mm or hole wall to wall spacing below 0.35mm process. It is also not suitable for CAF requirements process.				
证明 CERTIFICATE OF CONFORMANCE					
兹证明以上所列制品符合订单所述要求, 并符合IPC-4101刚性及多层印制板基材规格相应要求。This is to certify that the manufactured products listed above conform to the requirements specified in your Purchase Order and fulfill the corresponding requirements of the IPC-4101 Specification for Basic Materials for Rigid and Multilayer Printed Boards.					
结论 (Result) PASS					

检测 (Test): 许小娟

审核 (Check): 谢观松

HZ/FM3311 Rev: B0



浙江华正新材料股份有限公司

ZHEJIANG WAZAM NEW MATERIALS CO., LTD.

覆铜箔层压板检测报告及品质保证书

Copper Clad Laminate Quality Test Report And COC

订单号(P/O):

物料号(P/N):

出货日期(D/D): 20230816

型号(Type):	H140A 2.0mm H/H 1042*1245mm 黄色(YELLOW) FR-4.0 含铜 Inc. Cu	客户(Customer):	LLC Electroconnect (人民币)
	H140A 0.079" H/H 41*49" S	总数量(Total Qty):	100
箱号(P/N):	1358165		
批号(L/N):	23813PAB1004A		
数量(Qty)	100		
生产日期(M/D):	20230813		
有效日期(E/D):	20250812		

结构: 11 *7628

No	检测项目 Item	单位Unit	检测条件 Test Condition	规范值 Specification Value	测试值 Actual Value
1	外观 Visuals	—	A IPC-TM-650 2.1.5 2.1.9	CLASS A IPC-4101 3.8.3.1	PASS
2	板厚 Thickness	mm	A	IPC-4101 3.8.4.2.4	±0.180
		mil	IPC-TM-650 2.2.18		75.68 -- 2.084
3	尺寸公差 Panel Size Tolerance	mm	A	+2/-0	1.0
			IPC-TM-650 2.2.19.1	IPC-4101 3.8.4.1	
4	方正度 Squareness	mm	A	≤3.0	1.0
			IPC-TM-650 2.2.19.1	IPC-4101 3.8.4.1	
5	蚀刻特性 Etching Properties	—	A IPC-TM-650 2.1.5	无异常 No Abnormalities IPC-4101 3.8.3.1.6	PASS
6	板弯翘 Bow & Twist	%	A IPC-TM-650 2.4.22.1	IPC-4101 3.8.4.3	≤0.75
					0.25
7	剥离强度 Peel Strength	N/mm	288°C*10s IPC-TM-650 2.4.8	IPC-4101 3.9.1.1	≤0.75
					0.21
8	尺寸稳定性 Dimensional Stability	ppm	Etched+E-2/150 IPC-TM-650 2.4.39	IPC-4101 3.9.1.2	≥1.05
					1.32
9	弯曲强度 Flexural Strength	N/mm ²	A IPC-TM-650 2.4.4	IPC-4101 3.9.1.3	≥1.05
					1.31
10	燃烧性 Flammability	—	C-24/23/50+ E-24/125+des-4 IPC-TM-650 2.3.10	UL94 V-0 IPC-4101 3.10.1.1	≥1.05
					1.31
11	热应力 Thermal stress	S	E-2/125 IPC-TM-650 2.4.13.1	IPC-4101 3.10.1.2	≥1.05
					1.31
12	玻璃转移点 Glass transition temperature	°C	E-2/105 IPC-TM-650 2.4.25	IPC-4101 3.10.1.6	≥130
					133.89
13	介电常数 (DK) (1MHZ) Dielectric Constant	—	C-24/23/50 IPC-TM-650 2.5.5.2	IPC-4101 3.11.1.1	≥130
					132.29
14	介质损耗角正切 (DF) (1MHZ) Loss Tangent	—	C-24/23/50 IPC-TM-650 2.5.5.2	IPC-4101 3.11.1.2	≤3
					1.6
15	体积电阻 (RV) Volume Resistivity	MΩ·cm	C-96/35/90+E-24/125 IPC-TM-650 2.5.17.1	IPC-4101 3.11.1.3	≤5.4
					4.64
16	表面电阻 (RS) Surface Resistivity	MΩ	C-96/35/90+E-24/125 IPC-TM-650 2.5.17.1	IPC-4101 3.11.1.4	≤0.035
					0.025
17	耐电弧性 Arc Resistance	S	D-48/50+D-0.5/23 IPC-TM-650 2.5.1	IPC-4101 3.11.1.5	≥1.0×10 ⁶
					4.86×10 ⁸
18	击穿电压 Dielectric Beakdown	KV	D-48/50+D-0.5/23 IPC-TM-650 2.5.6	IPC-4101 3.11.1.6	≥1.0×10 ⁴
					5.30×10 ⁶
19	电气强度 Dielectric Strength	KV/mm	D-48/50+D-0.5/23 IPC-TM-650 2.5.6.2	IPC-4101 3.11.1.7	≥60
					122
20	相对漏电指数CTI Comparative Tracking Index	V	IEC-60112	175≤CTI<400 GB/T4207-2003	≥40
					59
21	吸水性 Moisture Absorption	%	E-1/105+des+D-24/23 IPC-TM-650 2.6.2.1	IPC-4101 3.12.1.1	≥30
					48
22	完善性 Pressure Vessel	S	PCT 120°C*1h IPC-TM-650 2.6.16	IPC-4101 3.12.1.3	≥10
					0.15

Note 1). 上述板材符合欧盟RoHS指令。The above laminate(s) is accord with RoHS directive.
 2). 本材料不适用于0.3mm以下孔径或0.35mm以下孔间距及对CAF有要求的制程。The material is not suitable for hole sizes below 0.3mm or hole wall to wall spacing below 0.35mm process. It is also not suitable for CAF requirements process.

证明 CERTIFICATE OF CONFORMANCE

兹证明以上所列制成品符合订单所述要求, 并符合IPC-4101刚性及多层印制板基材规格相应要求。This is to certify that the manufactured products listed above conform to the requirements specified in your Purchase Order and fulfill the corresponding requirements of the IPC-4101 Specification for Basic Materials for Rigid and Multilayer Printed Boards.

检测 (Test): 牛小娟

审核 (Check): 谢观松

HZ/FM3311 Rev: B0





半固化片测试报告
Test Report Of Prepreg

订单号(P/O): 1230809

物料号(P/N):

出货日期(D/D):

20230816

型号/规格 Type:	H140AP 1080 RC63% 1260mm*300m黄色				客户(Customer):	LLC Electroconnect (人民币)	
					总数量(Total Qty):	10	Roll 3000 m
批号 Lot No.:	23813TAD1001A	23813TAD1002A	23813TAD1003A	23813TAD1004A	23813TAD1005A	23813TAD1006A	
	23813TAD1007A	23813TBD1005A	23813TBD1006A	23813TBD1008A			

No	检测项目 Item	单位 Unit	检测条件 Test Condition	规范值 Specification Value	测试值 Actual Value
1	外观 Appearance	—	IPC-TM-650 2.1.5	IPC-4101 3.8.3.2	PASS
2	长度 Length	m	IPC-TM-650 2.2.19.1	≥300 IPC-4101 3.8.4.1.2	300
3	宽度 Width	mm	IPC-TM-650 2.2.19.1	+3/0 IPC-4101 3.8.4.1.2	1260
4	树脂含量 Resin Content	%	IPC-TM-650 2.3.16.1	63±2 IPC-4101 3.9.2.1.1	61.3
5	凝胶时间 Gel Time	Sec	IPC-TM-650 2.3.18	130±20 IPC-4101 3.9.2.2.7	128
6	树脂流动度 Resin Flow	%	IPC-TM-650 2.3.17	40±5 IPC-4101 3.9.2.2.1	38.5
7	挥发份 Volatileness	%	IPC-TM-650 2.3.19	≤0.75 IPC-4101 3.9.2.2.8	0.31

我司保证以上产品符合IPC-4101之国际标准要求，以上项目测试方法均参照IPC-TM-650执行。We certify the above material conforming to the specification of IPC-4101, and test method follows the IPC-TM-650 strictly.

备注Remark:

Inspector

审核(Check): 谢观松

HZ/FM3345 Rev: B0





浙江华正新材料股份有限公司
ZHEJIANG WAZAM NEW MATERIALS CO., LTD.

半固化片测试报告
Test Report Of Prepreg

订单号(P/O): E230809

物料号(P/N):

出货日期(D/D): 20230816

型号/规格 Type:	H140AP 7628 RC45% 1260mm*150m黄色			客户(Customer):	LLC Electroconnect (人民币)	
				总数量(Total Qty):	36	Roll 5400 m
批号 Lot No.:	23813TAD1020A	23813TAD1021A	23813TAD1022A	23813TAD1023A	23813TAD1024A	23813TAD1025A
	23813TAD1026A	23813TAD1027A	23813TAD1028A	23813TAD1011A	23813TAD1012A	23813TAD1013A
	23813TAD1015A	23813TAD1016A	23813TAD1017A	23813TAD1018A	23813TAD1019A	23813TAD1035A
	23813TAD1038A	23813TAD1039A	23813TAD1040A	23813TAD1041A	23814TBD1001A	23814TBD1002A
	23814TBD1003A	23813TAD1014A	23813TAD1029A	23813TAD1030A	23813TAD1031A	23813TAD1032A
	23813TAD1033A	23813TAD1034A	23813TAD1036A	23813TAD1037A	23813TAD1009A	23813TAD1010A

No	检测项目 Item	单位 Unit	检测条件 Test Condition	规范值 Specification Value	测试值 Actual Value
1	外观 Appearance	—	IPC-TM-650 2.1.5	IPC-4101 3.8.3.2	PASS
2	长度 Length	m	IPC-TM-650 2.2.19.1	≥150 IPC-4101 3.8.4.1.2	150
3	宽度 Width	mm	IPC-TM-650 2.2.19.1	+3/0 IPC-4101 3.8.4.1.2	1260
4	树脂含量 Resin Content	%	IPC-TM-650 2.3.16.1	45±2 IPC-4101 3.9.2.1.1	44.0
5	凝胶时间 Gel Time	Sec	IPC-TM-650 2.3.18	130±20 IPC-4101 3.9.2.2.7	141
6	树脂流动度 Resin Flow	%	IPC-TM-650 2.3.17	26±5 IPC-4101 3.9.2.2.1	24.2
7	挥发份 Volatileness	%	IPC-TM-650 2.3.19	≤0.75 IPC-4101 3.9.2.2.8	0.32

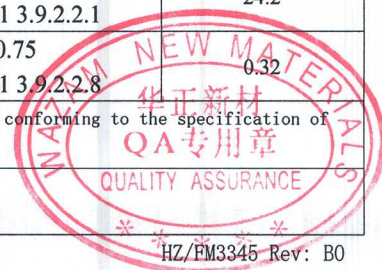
我司保证以上产品符合IPC-4101之国际标准要求，以上项目测试方法均参照IPC-TM-650执行。We certify the above material conforming to the specification of IPC-4101, and test method follows the IPC-TM-650 strictly.

备注Remark:

检测 (Test): 牛小娟

审核 (Check): 谢观松

HZ/FM3345 Rev: B0





浙江华正新材料股份有限公司

JIANG WAZAM NEW MATERIALS CO., LTD.

覆铜箔层压板检测报告及品质保证书

Copper Clad Laminate Quality Test Report And COC

订单号(P/O): **E230809**

物料号(P/N):

出货日期(D/D): 20230816

型号(Type):	H140A 1.5mm 1/0 1042*1245mm 黄色(YELLOW) FR-4.0 含铜 Inc. Cu	客户(Customer):	LLC Electroconnect (人民币)
箱号(P/N):	3000637520	总数量(Total Qty):	300
批号(L/N):	23810PCK3008A 23810PCK3006A		
生产日期(M/D)	20230810 20230810		
有效日期(E/D)	20250809 20250809		

结构: 8*7628

No	检测项目 Item	单位Unit	检测条件 Test Condition	规范值 Specification Value	测试值 Actual Value
1	外观 Visuals	—	A IPC-TM-650 2.1.5 2.1.9	CLASS A IPC-4101 3.8.3.1	PASS
2	板厚 Thickness	mm mil	A IPC-TM-650 2.2.18	IPC-4101 3.8.4.2.4 ±0.130 ±5.0	1.418 -- 1.517 56.72 -- 60.68
3	尺寸公差 Panel Size Tolerance	mm	A IPC-TM-650 2.2.19.1	+2/-0 IPC-4101 3.8.4.1	1.0
4	方正度 Squareness	mm	A IPC-TM-650 2.2.19.1	≤3.0 IPC-4101 3.8.4.1	1.0
5	蚀刻特性 Etching Properties	—	A IPC-TM-650 2.1.5	无异常 No Abnormalities IPC-4101 3.8.3.1.6	PASS
6	板弯翘 Bow&Twist	%	A IPC-TM-650 2.4.22.1	IPC-4101 3.8.4.3	≤0.75 0.14
7	剥离强度 Peel Strength	N/mm	288°C*10s IPC-TM-650 2.4.8	IPC-4101 3.9.1.1	≥1.40 1.81
8	尺寸稳定性 Dimensional Stability	ppm	经向 Warp IPC-TM-650 2.4.39 纬向 Fill	IPC-4101 3.9.1.2	NA NA
9	弯曲强度 Flexural Strength	N/mm2	经向 Warp IPC-TM-650 2.4.4 纬向 Fill	IPC-4101 3.9.1.3	≥415 602 ≥345 486
10	燃烧性 Flammability	—	C-24/23/50+ E-24/125+des-4 IPC-TM-650 2.3.10	UL94 V-0 IPC-4101 3.10.1.1	V-0
11	热应力 Thermal stress	S	E-2/125 IPC-TM-650 2.4.13.1	>10 IPC-4101 3.10.1.2	无分层、无起泡 No Delamination、No Blistering
12	玻璃转移点 Glass transition temperature	°C	ΔTG IPC-TM-650 2.4.25	IPC-4101 3.10.1.6 IPC-4101 3.10.1.7	≥130 132.58 ≥130 133.25 ≤3 -0.67
13	介电常数(DK)(1MHZ) Dielectric Constant	—	C-24/23/50 IPC-TM-650 2.5.5.2	≤5.4 IPC-4101 3.11.1.1	4.70
14	介电损耗角正切(DP)(1MHZ) Loss Tangent	—	C-24/23/50 IPC-TM-650 2.5.5.2	≤0.035 IPC-4101 3.11.1.2	0.025
15	体积电阻(RV) Volume Resistivity	MΩ·cm	C-96/35/90+E-24/125 IPC-TM-650 2.5.17.1	≥1.0×10 ⁶ IPC-4101 3.11.1.3	4.00*10 ⁸
16	表面电阻(RS) Surface Resistivity	MΩ	C-96/35/90+E-24/125 IPC-TM-650 2.5.17.1	≥1.0×10 ⁴ IPC-4101 3.11.1.4	4.20*10 ⁶
17	耐电弧性 Arc Resistance	S	D-48/50+D-0.5/23 IPC-TM-650 2.5.1	≥60 IPC-4101 3.11.1.5	121
18	击穿电压 Dielectric Beakdown	KV	D-48/50+D-0.5/23 IPC-TM-650 2.5.6	≥40 IPC-4101 3.11.1.6	55
19	电气强度 Dielectric Strength	KV/mm	D-48/50+D-0.5/23 IPC-TM-650 2.5.6.2	≥30 IPC-4101 3.11.1.7	44
20	相对漏电指数CTI Comparative Tracking Index	V	IEC-60112	175≤CTI<400 GB/T4207-2003	200
21	吸水性 Moisture Absorption	%	E-1/105+des+D-24/23 IPC-TM-650 2.6.2.1	≤0.8 IPC-4101 3.12.1.1	0.22
22	完善性 Pressure Vessel	S	PCT 120°C*1h IPC-TM-650 2.6.16	>10 IPC-4101 3.12.1.3	无分层、无起泡 No Delamination、No Blistering

Note 1). 上述板材符合欧盟RoHS指令。The above laminate(s) is accord with RoHS directive.
 2). 本材料不适用于0.3mm以下孔径或0.35mm以下孔间距及对CAF有要求的制程。The material is not suitable for hole sizes below 0.3mm or hole to wall spacing below 0.35mm process. It is also not suitable for CAF requirements process.

证明 CERTIFICATE OF CONFORMANCE

兹证明以上所列制成品符合订单所述要求, 并符合IPC-4101刚性及多层印制板基材规格相应要求。This is to certify that the manufacture products listed above conform to the requirements specified in your Purchase Order and fulfill the corresponding requirements of the IPC-4101 Specification for Basic Materials for Rigid and Multilayer Printed Boards.

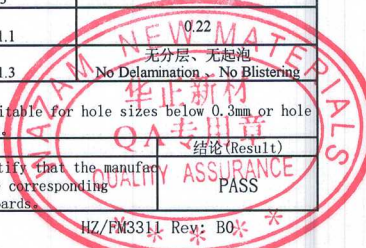
结论(Result)

PASS

检测 (Test): 牛小娟

审核 (Check): 谢观松

HZ/FM3311 Rev: B0





浙江华正新材料股份有限公司 ZHEJIANG WAZAM NEW MATERIALS CO., LTD.

覆铜箔层压板检测报告及品质保证书

Copper Clad Laminate Quality Test Report And COC

订单号(P/O):

物料号(P/N):

出货日期(D/D): 20230816

型号 (Type):	H140A 2.0mm 1/0 1042*1245mm 黄色(YELLOW) FR-4.0 含铜 Inc. Cu	客户 (Customer):	LLC Electroconnect (人民币)
	H140A 0.079" 1/0 41*49" S	总数量 (Total Qty):	200
箱号 (P/N):	1358167		
批号 (L/N):	23812PBB1011A		
数量 (Qty):	200		
生产日期 (M/D):	20230812		
有效日期 (E/D):	20250811		

结构: 11 *7628

No	检测项目 Item	单位 Unit	检测条件 Test Condition	规范值 Specification Value	测试值 Actual Value
1	外观 Visuals	—	A IPC-TM-650 2.1.5 2.1.9	CLASS A IPC-4101 3.8.3.1	PASS
2	板厚 Thickness	mm mil	A IPC-TM-650 2.2.18	IPC-4101 3.8.4.2.4 ±0.180 ±7.0	1.878 -- 2.050 75.12 -- 82.00
3	尺寸公差 Panel Size Tolerance	mm	A IPC-TM-650 2.2.19.1	+2/-0 IPC-4101 3.8.4.1	1.0
4	方正度 Squareness	mm	A IPC-TM-650 2.2.19.1	≤3.0 IPC-4101 3.8.4.1	1.0
5	蚀刻特性 Etching Properties	—	A IPC-TM-650 2.1.5	无异常 No Abnormalities IPC-4101 3.8.3.1.6	PASS
6	板弯翘 Bow & Twist	%	A IPC-TM-650 2.4.22.1	IPC-4101 3.8.4.3	≤0.75 0.20 ≤0.75 0.21
7	剥离强度 Peel Strength	N/mm	288°C*10s IPC-TM-650 2.4.8	IPC-4101 3.9.1.1	≥1.40 1.79 NA NA
8	尺寸稳定性 Dimensional Stability	ppm	Etched+E-2/150 IPC-TM-650 2.4.39	IPC-4101 3.9.1.2	NA NA NA NA
9	弯曲强度 Flexural Strength	N/mm ²	A IPC-TM-650 2.4.4	IPC-4101 3.9.1.3	≥415 569 ≥345 476
10	燃烧性 Flammability	—	C-24/23/50+ E-24/125+des-4 IPC-TM-650 2.3.10	UL94 V-0 IPC-4101 3.10.1.1	V-0
11	热应力 Thermal stress	S	E-2/125 IPC-TM-650 2.4.13.1	>10 IPC-4101 3.10.1.2	无分层、无起泡 No Delamination、No Blistering
12	玻璃转移点 Glass transition temperature	TG1 TG2 ΔTG	E-2/105 IPC-TM-650 2.4.25	IPC-4101 3.10.1.6 IPC-4101 3.10.1.7	≥130 132.98 ≥130 133.67 ≤3 -0.69
13	介电常数 (DK) (1MHZ) Dielectric Constant	—	C-24/23/50 IPC-TM-650 2.5.5.2	≤5.4 IPC-4101 3.11.1.1	4.54
14	介质损耗角正切 (DF) (1MHZ) Loss Tangent	—	C-24/23/50 IPC-TM-650 2.5.5.2	≤0.035 IPC-4101 3.11.1.2	0.022
15	体积电阻 (RV) Volume Resistivity	MΩ·cm	C-96/35/90+E-24/125 IPC-TM-650 2.5.17.1	≥1.0×10 ⁶ IPC-4101 3.11.1.3	5.26×10 ⁸
16	表面电阻 (RS) Surface Resistivity	MΩ	C-96/35/90+E-24/125 IPC-TM-650 2.5.17.1	≥1.0×10 ⁴ IPC-4101 3.11.1.4	1.90×10 ⁶
17	耐电弧性 Arc Resistance	S	D-48/50+D-0.5/23 IPC-TM-650 2.5.1	≥60 IPC-4101 3.11.1.5	126
18	击穿电压 Dielectric Beakdown	KV	D-48/50+D-0.5/23 IPC-TM-650 2.5.6	≥40 IPC-4101 3.11.1.6	53
19	电气强度 Dielectric Strength	KV/mm	D-48/50+D-0.5/23 IPC-TM-650 2.5.6.2	≥30 IPC-4101 3.11.1.7	36
20	相对漏电指数CTI Comparative Tracking Index	V	IEC-60112	175≤CTI<400 GB/T4207-2003	225
21	吸水性 Moisture Absorption	%	E-1/105+des+D-24/23 IPC-TM-650 2.6.2.1	≤0.8 IPC-4101 3.12.1.1	0.19
22	完善性 Pressure Vessel	S	PCT 120°C*1h IPC-TM-650 2.6.16	>10 IPC-4101 3.12.1.3	无分层、无起泡 No Delamination、No Blistering

Note 1). 上述板材符合欧盟RoHS指令。The above laminate(s) is accord with RoHS directive.
2). 本材料不适用于0.3mm以下孔径或0.35mm以下孔间距及对CAF有要求的制程。The material is not suitable for hole sizes below 0.3mm or hole wall to wall spacing below 0.35mm process. It is also not suitable for CAF requirements process.

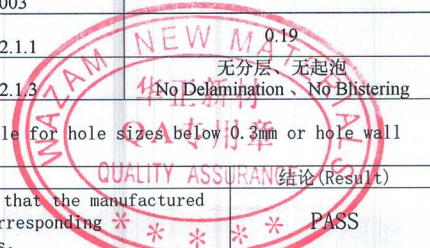
证明 CERTIFICATE OF CONFORMANCE

兹证明以上所列制品符合订单所述要求, 并符合IPC-4101刚性及多层印制板基材规格相应要求。This is to certify that the manufactured products listed above conform to the requirements specified in your Purchase Order and fulfill the corresponding requirements of the IPC-4101 Specification for Basic Materials for Rigid and Multilayer Printed Boards.

检测 (Test): 牟小娟

审核 (Check): 谢观松

HZ/FM3311 Rev: B0





覆铜箔层压板检测报告及品质保证书
Copper Clad Laminate Quality Test Report And COC

订单号(P/O):

物料号(P/N):

出货日期(D/D): 20230816

型号 (Type):	H140A 1.0mm 1/0 1042*1245mm 黄色(YELLOW) FR-4.0 含铜 Inc. Cu	客户 (Customer):	LLC Electroconnect (人民币)
	H140A 0.039" 1/0 41*49" S	总数量 (Total Qty):	100
箱号 (P/N):	1358164		
批号 (L/N):	23811PAC1001A		
数量 (Qty):	100		
生产日期 (M/D):	20230811		
有效日期 (E/D):	20250810		

结构: 5*7628

No	检测项目 Item	单位 Unit	检测条件 Test Condition	规范值 Specification Value	测试值 Actual Value
1	外观 Visuals	—	A IPC-TM-650 2.1.5 2.1.9	CLASS A IPC-4101 3.8.3.1	PASS
2	板厚 Thickness	mm mil	A IPC-TM-650 2.2.18	IPC-4101 3.8.4.2 ±0.100 ±4.0	0.931 -- 1.040 37.24 -- 41.60
3	尺寸公差 Panel Size Tolerance	mm	A IPC-TM-650 2.2.19.1	+2/-0 IPC-4101 3.8.4.1	1.0
4	方正度 Squareness	mm	A IPC-TM-650 2.2.19.1	≤3.0 IPC-4101 3.8.4.1	1.0
5	蚀刻特性 Etching Properties	—	A IPC-TM-650 2.1.5	无异常 No Abnormalities IPC-4101 3.8.3.1.6	PASS
6	板弯翘 Bow & Twist	%	A IPC-TM-650 2.4.22.1	IPC-4101 3.8.4.3	≤0.75 0.19
7	剥离强度 Peel Strength	N/mm	288°C*10s IPC-TM-650 2.4.8	IPC-4101 3.9.1.1	≥1.40 1.76
8	尺寸稳定性 Dimensional Stability	ppm	Etched+E-2/150 IPC-TM-650 2.4.39	IPC-4101 3.9.1.2	NA NA
9	弯曲强度 Flexural Strength	N/mm ²	A IPC-TM-650 2.4.4	IPC-4101 3.9.1.3	≥415 581 493
10	燃烧性 Flammability	—	C-24/23/50+ E-24/125+des-4 IPC-TM-650 2.3.10	UL94 V-0 IPC-4101 3.10.1.1	V-0
11	热应力 Thermal stress	S	E-2/125 IPC-TM-650 2.4.13.1	>10 IPC-4101 3.10.1.2	无分层、无起泡 No Delamination、No Blistering
12	玻璃转移点 Glass transition temperature	TG1 TG2 ΔTG	E-2/105 IPC-TM-650 2.4.25	IPC-4101 3.10.1.6 IPC-4101 3.10.1.7	≥130 133.67 ≥130 133.46 ≤3 0.21
13	介电常数 (DK) (1MHZ) Dielectric Constant	—	C-24/23/50 IPC-TM-650 2.5.5.2	≤5.4 IPC-4101 3.11.1.1	4.59
14	介质损耗角正切 (DF) (1MHZ) Loss Tangent	—	C-24/23/50 IPC-TM-650 2.5.5.2	≤0.035 IPC-4101 3.11.1.2	0.020
15	体积电阻 (RV) Volume Resistivity	MΩ·cm	C-96/35/90+E-24/125 IPC-TM-650 2.5.17.1	≥1.0×10 ⁶ IPC-4101 3.11.1.3	6.96×10 ⁸
16	表面电阻 (RS) Surface Resistivity	MΩ	C-96/35/90+E-24/125 IPC-TM-650 2.5.17.1	≥1.0×10 ⁴ IPC-4101 3.11.1.4	6.08×10 ⁶
17	耐电弧性 Arc Resistance	S	D-48/50+D-0.5/23 IPC-TM-650 2.5.1	≥60 IPC-4101 3.11.1.5	124
18	击穿电压 Dielectric Beakdown	KV	D-48/50+D-0.5/23 IPC-TM-650 2.5.6	≥40 IPC-4101 3.11.1.6	58
19	电气强度 Dielectric Strength	KV/mm	D-48/50+D-0.5/23 IPC-TM-650 2.5.6.2	≥30 IPC-4101 3.11.1.7	41
20	相对漏电指数CTI Comparative Tracking Index	V	IEC-60112	175≤CTI<400 GB/T4207-2003	225
21	吸水性 Moisture Absorption	%	E-1/105+des+D-24/23 IPC-TM-650 2.6.2.1	≤0.8 IPC-4101 3.12.1.1	0.21
22	完普性 Pressure Vessel	S	PCT 120°C*1h IPC-TM-650 2.6.16	>10 IPC-4101 3.12.1.3	无分层、无起泡 No Delamination、No Blistering

Note 1). 上述板材符合欧盟RoHS指令。The above laminate(s) is accord with RoHS directive.
2). 本材料不适用于0.3mm以下孔径或0.35mm以下孔间距及对CAF有要求的制程。The material is not suitable for hole sizes below 0.3mm or hole wall to wall spacing below 0.35mm process. It is also not suitable for CAF requirements process.

证明 CERTIFICATE OF CONFORMANCE

QUALITY ASSURANCE 结论 (Result)

兹证明以上所列制成成品符合订单所述要求, 并符合IPC-4101刚性及多层印制板基材规格相应要求。This is to certify that the manufactured products listed above conform to the requirements specified in your Purchase Order and fulfill the corresponding requirements of the IPC-4101 Specification for Basic Materials for Rigid and Multilayer Printed Boards.

PASS

检测 (Test): 牛小娟

审核 (Check): 谢观松

HZ/FM3311 Rev: B0

