

江苏星源航天材料股份有限公司

Jiangsu Sunyuan Aerospace Material Co.,LTD

FR-4覆铜板检测报告

FR-4 COPPER CLAD LAMINATE CERTIFICATE OF QUALITY

客户名称Customer	波兰		出货日期Date	2010-9-1		
品名Commodity	FR-4		数量Quantity	800 Sheets		
规格Style	1.5mm 1/0 OZ 43" x49" Yellow		等级 Grade	A		
序号 No.	试验项目 (Test item)		试验条件 (Test condition)	单位 (Units)	指标 (Index)	测试结果 Typical Value
1	板材厚度 Thickness		A	mm	1.5±0.075	1.43~1.56
2	剥离强度 Peel Strength	接收态 As Received	A	kg/cm	≥1.43	1.68
		热应力后 After Thermal Stress			≥1.43	1.68
3	表面电阻 Surface Resistivity	潮湿后 After Moisture	F	MΩ	≥10 ⁴	≥10 ⁶
		高温下 At Elevated Temperature	E-24/125		≥10 ³	≥10 ⁵
4	体积电阻 Volume Resistivity	潮湿后 After Moisture	F	MΩ.cm	≥10 ⁶	≥10 ⁸
		高温下 At Elevated Temperature	E-24/125		≥10 ³	≥10 ⁵
5	弯曲强度 Flexural Strength	纵向 Length direction	A	N/mm ²	≥415	550
		横向 Cross direction			≥345	435
6	击穿电压Dielectric Breakdown		D-48/50+D-0.5/23	KV	≥40	42
7	介电常数,1MHZ,最大 Permittivity at 1 MHZ ,maximum		A	-	≤5.4	4.5
8	介质损耗角正切, 1MHZ, 最大 Loss Tangent 1MHZ ,maximum		A	-	≤0.035	0.032
9	耐电弧性Arc Resistance,minimum		A	S	≥60	120
10	吸水性Moisture Absorption,maximum		E-1/105+des	%	≤0.35	0.23
11	阻燃性Flammability		A	S	UL94 V-0	UL94 V-0
12	尺寸稳定性Dimensional Stability		A	ppm	±300	±150
13	弓曲和扭曲Bow And Twist		A	%	≤1.5	0.35~0.45
14	热应力 Thermal Stress (288℃.10s 3次)	未蚀刻样品 Unetched	A	-	NO DEFECT	NO DEFECT
		蚀刻后的样品 Etched			NO DEFECT	NO DEFECT
15	压力容器试验 (260℃、20s) Pressure Vessel		A	-	NO DEFECT	NO DEFECT
16	相比漏电起痕指数(CTI)		A	V	≥175	200
17	玻璃化转变温度Tg(DSC)		A	℃	≥130	136
18	固化因数(ΔTg)		A	℃	≤3	1

兹证明板料符合IPC-4101B/21及欧盟RoHS规范要求, UL档案号为: E214321.



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品名Commodity		FR-4		数量Quantity	800 Sheets	
规格Style		1.5mm H/H OZ 43" x49" Yellow		等级Grade	A	
序号 No.	试验项目 (Test item)		试验条件 (Test condition)	单位 (Units)	指标 (Index)	测试结果 Typical Value
1	板材厚度 Thickness		A	mm	1.5±0.075	1.43~1.57
2	剥离强度 Peel Strength	接收态 As Received	A	kg/cm	≥1.07	1.36
		热应力后 After Thermal Stress			≥1.07	1.36
3	表面电阻 Surface Resistivity	潮湿后 After Moisture	F	MΩ	≥10 ⁴	≥10 ⁶
		高温下 At Elevated Temperature	E-24/125		≥10 ³	≥10 ⁵
4	体积电阻 Volume Resistivity	潮湿后 After Moisture	F	MΩ.cm	≥10 ⁶	≥10 ⁸
		高温下 At Elevated Temperature	E-24/125		≥10 ³	≥10 ⁵
5	弯曲强度 Flexural Strength	纵向 Length direction	A	N/mm ²	≥415	550
		横向 Cross direction			≥345	435
6	击穿电压Dielectric Breakdown		D-48/50+D-0.5/2	KV	≥40	42
7	介电常数,1MHZ,最大 Permittivity at 1 MHZ ,maximum		A	-	≤5.4	4.5
8	介质损耗角正切, 1MHZ, 最大 Loss Tangent 1MHZ ,maximum		A	-	≤0.035	0.032
9	耐电弧性Arc Resistance,minimum		A	S	≥60	120
10	吸水性Moisture Absorption,maximum		E-1/105+des	%	≤0.35	0.23
11	阻燃性Flammability		A	S	UL94 V-0	UL94 V-0
12	尺寸稳定性Dimensional Stability		A	ppm	±300	±150
13	弓曲和扭曲Bow And Twist		A	%	≤1.0	0.35~0.45
14	热应力 Thermal Stress (288℃、20s)	未蚀刻样品 Unetched	A	-	NO DEFECT	NO DEFECT
		蚀刻后的样品 Etched			NO DEFECT	NO DEFECT
15	压力容器试验 (260℃、10s/3次) Pressure Vessel		A	-	NO DEFECT	NO DEFECT
16	相比漏电起痕指数(CTI)		A	V	≥175	200
17	玻璃化转变温度Tg(DSC)		A	℃	≥130	136
18	固化因数(Δ Tg)		A	℃	≤3	1

兹证明板料符合IPC-4101B/21及欧盟RoHS规范要求, UL档案号为: E214321.



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出货检验报告 TEST REPORT



品名 Product	覆铜箔板 CCL	等级 Grade	A	批号 LOT	3100829112 3100829363	
型号 Type	V-76 (CEM-1)	数量 Quantity	150	铜箔 Copper	1/0	日期 Date 2010.8.21

序号 No	测试项目 Test Item	单位 Unit	处理条件 Condition	要求值 Requirement	结论 Result
1	外观 Surface		A	A	合格
2	厚度 Thickness	mm	A	1.6 ± 0.14	合格
3	尺寸 Size	mm	A	1020 X 1220	合格
4	体积电阻 Volume Resistivity	O.cm	C-96/20/65 C-96/40/90	≥ 1.0 × 10 ¹³ ≥ 1.0 × 10 ¹²	合格
5	表面电阻 Surface Resistivity	O.cm	C-96/20/65 C-96/40/90	≥ 1.0 × 10 ¹² ≥ 1.0 × 10 ¹¹	合格
6	介电常数 Dielectric Constant	-	C-96/20/65 D-24/23	≤ 5.0 ≤ 5.5	合格
7	介质损耗因素 Dissipation Factor	-	C-96/20/65 D-24/23	≤ 0.045 ≤ 0.050	合格
8	剥离强度(35mic) Peel Strength	Kgf/cm	A S	> 1.2	合格
9	耐浸焊性 Solder Resistanc	Sec	A-260°C	≥ 20	合格
10	屈曲强度 Flexural Strength	Kg/mm ²	A	≥ 20	合格
11	耐药品性 Chemical Risistivity	-	3% NaOH 40°C 3min	No Remark	合格
12	吸水率 Water Absorption	%	E-24/50 + D-24/23	≤ 0.8	合格
13	UL 阻燃等级 UL Flam Grade	-	A	94V-0	合格

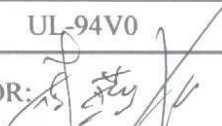
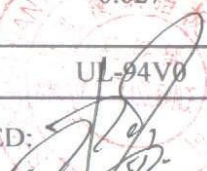
Note: CERTIFYING MERCHANDISE TO BE OF IPC AND JIS STANDARD.

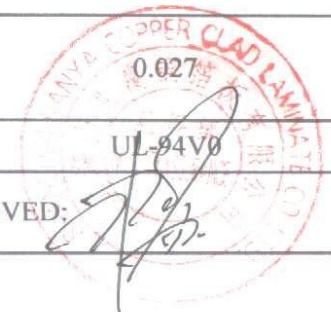
测试
Test 李梦丹

审核
Check 李芸莉



LAMINATE TESTING REPORT

CUSTOMER	波兰Z&Z		REPORT DATE	July 21, 2009	
TYPE	FR-4	P.O NO	Z&Z0902	MATERIAL NO.	—————
SPECIFICATION	1.5mm 35/00 1092mm×1245mm Yellow Logo				
QUANTITY	250 sheets	GRADE	A	RESIN TYPE	Normal TG
LOT NO	B90723122				Pallet NO 06
TESTING ITEM		SPECIFICATION		TESING RESULT	
1.SURFACE AND SUBSURFACE IMPERFECTION		IPC-4101B 3.8.3.1.6		ACC	
2.BOW AND TWIST		IPC-4101B 3.8.4.3		0.45%-0.55%	
3.THERMAL STRESS UNETCHED ETCHED		IPC-4101B 3.10.1.2		NO DEFECT	
4.PEEL STRENGTH AS RECEIVED AFTER THERMAL STRESS		IPC-4101B 3.9.1.1 8LB/IN 8LB/IN		12.0LB/IN~12.7LB/IN	
5.PRESSURE VESSEL THERMAL STRESS		IPC-4101B 3.12.1.3		NO DEFECT	
6.TG		DSC≥130 ⁰ c		134 ⁰ c~136 ⁰ c	
7.VOLUME RESISTIVITY AFTER MOISTURE AFTER TEMPERATURE CYCLE AT ELEVATED TEMPERATURE		IPC-4101B 3.11.1.3 ≥10 ⁶ MΩ.CM ≥10 ³ MΩ.CM		≥10 ⁷ MΩ.CM ≥10 ⁵ MΩ.CM	
8.SURFACE RESISTIVITY AFTER MOISTURE AFTER TEMPERATURE CYCLE AT ELEVATED TEMPERATURE		IPC-4101B 3.11.1.4 ≥10 ⁴ MΩ ≥10 ³ MΩ		≥10 ⁶ MΩ ≥10 ⁵ MΩ	
9.DIELECTRIC BREAKDOWN (PARALLEL LAMINATIONS)		IPC-4101B 3.11.1.6 ≥40KV		42	
10.DIELECTRIC CONSTANT		IPC-4101B 3.11.1.1 AT 1MHZ≤5.4		4.4~4.6	
11.LOSS TANGENT		IPC-4101B 3.11.1.2 AT 1MHZ≤0.035		0.027	
12.FLAMMABILITY		UL-94V0		UL-94V0	
FINAL TESTING RESULT : ACC		INSPECTOR: 		APPROVED: 	





LAMINATE TESTING REPORT

CUSTOMER	波兰Z&Z		REPORT DATE	July 21, 2009	
TYPE	FR-4	P.O NO	Z&Z0902	MATERIAL NO.	_____
SPECIFICATION	1.5mm 18/18 1092mm×1245mm Yellow Logo				
QUANTITY	200 sheets	GRADE	A	RESIN TYPE	Normal TG
LOT NO	B90732222			Pallet NO	08
TESTING ITEM	SPECIFICATION		TESING RESULT		
1.SURFACE AND SUBSURFACE IMPERFECTION	IPC-4101B 3.8.3.1.6		ACC		
2.BOW AND TWIST	IPC-4101B 3.8.4.3		0.35%-0.45%		
3.THERMAL STRESS UNETCHED ETCHED	IPC-4101B 3.10.1.2		NO DEFECT		
4.PEEL STRENGTH AS RECEIVED AFTER THERMAL STRESS	IPC-4101B 3.9.1.1 6LB/IN 6LB/IN		8.1LB/IN~8.8LB/IN		
5.PRESSURE VESSEL THERMAL STRESS	IPC-4101B 3.12.1.3		NO DEFECT		
6.TG	DSC≥130 ⁰ c		134 ⁰ c~136 ⁰ c		
7.VOLUME RESISTIVITY AFTER MOISTURE AFTER TEMPERATURE CYCLE AT ELEVATED TEMPERATURE	IPC-4101B 3.11.1.3 ≥10 ⁶ MΩ.CM ≥10 ³ MΩ.CM		≥10 ⁷ MΩ.CM ≥10 ⁵ MΩ.CM		
8.SURFACE RESISTIVITY AFTER MOISTURE AFTER TEMPERATURE CYCLE AT ELEVATED TEMPERATURE	IPC-4101B 3.11.1.4 ≥10 ⁴ MΩ ≥10 ³ MΩ		≥10 ⁶ MΩ ≥10 ⁵ MΩ		
9.DIELECTRIC BREAKDOWN (PARALLEL LAMINATIONS)	IPC-4101B 3.11.1.6 ≥40KV		42		
10.DIELECTRIC CONSTANT	IPC-4101B 3.11.1.1 AT 1MHZ≤5.4		4.4-4.6		
11.LOSS TANGENT	IPC-4101B 3.11.1.2 AT 1MHZ≤0.035		0.027		
12.FLAMMABILITY	UL-94V0		UL-94V0		
FINAL TESTING RESULT : ACC	INSPECTOR:		APPROVED:		