

免清洗无卤焊锡膏

No clean, Halogen-free solder paste

EcoAPP-NH4

技术资料 Technical Data Sheet

1. 简介 Description

EcoAPP-NH4 是一种散热型低空洞焊锡膏，符合无铅无卤免清洗的要求，兼容 SAC305、SAC105 和 SAC0307 等合金。特别适用于 MOS 管底座及新能源的功率半导体等器件的低空洞要求，它可以提高器件的散热，使器件具有更好的性能和寿命。

EcoAPP NH4 is a heat dissipation type low void solder paste that meets the requirements of lead-free, halogen-free, and no-cleaning. It is compatible with features such as SAC305, SAC105, and SAC0307 alloys. Specially suitable for low void requirements of MOS transistor bases and power semiconductors for new energy vehicles. it can improve device heat dissipation and provide better performance and lifespan.

2. 产品特性 Product Features

合金 Alloy	熔点 Melting point	粉末尺寸 Powder size	合金含量 Alloy content	
Sn96.5Ag3.0Cu0.5	217-221℃	T5 (15~25μm) T4 (20~38μm)	80%~90%	
Sn98.5Ag1.0Cu0.5	217-227℃			
Sn99.0Ag0.3Cu0.7	217-227℃			
包装规格 Package: (500±2) g per jar 注：如果要求使用其他合金成分、粉末尺寸或包装规格，请联系汉尔信。 Note: If you need other alloy composition, powder size or package, please contact with HOERSON.				
环保要求 Environmental protection requirements				
标准/法规 Standard or statute	要求 Requirement		测试方法 Test method	状态 State
IEC 61249-2-21	在焊接后残留中，阻燃剂中的Br和Cl浓度 低于 900ppm 或 总 浓 度 低 于 1500ppm The maximum total halogens contained in the resin plus reinforcement matrix is 1500ppm with a maximum chlorine 900ppm and maximum bromine being			PASS

	900ppm.		
RoHS Directive 2011/65/EU	符合RoHS测试结果要求 The test results meet the RoHS directive requirement	IEC 62321	PASS
欧盟第 1907/2006 号 REACH法规 Regulation (EC) No 1907/2006 concerning the reach	SVHC清单物质测试结果不超过限值 The test results of SVHC list material are not exceed the limit	IEC-OES、 UV-VIS、 GC-MS、 HPLC-DAD/ MS	PASS

3. 应用 Application

钢网模板设计 Stencil Design:

- 电铸和激光切割、电解抛光试样钢网具有最佳的印刷特性。丝印钢网的开口设计是优化印刷工艺的关键，我们一般建议进行如下的设计：

Electroformed and laser cut electropolished stencils produce the best printing characteristics among stencil types. Stencil aperture design is a crucial step in optimizing the print process. The following are a few general recommendations:

- 分立元件：钢网开口面积减少10%到20%，这样可以很大程度上降低或消除元件间锡珠的出现，可采用常见的“屋顶形状”的开口设计来达到减少落锡面积。

Discrete components: A 10-20% reduction in stencil aperture area may significantly reduce or eliminate the occurrence of mid-chip solder beads. The “home plate” design is a common method for achieving this reduction.

- 密脚距元件：对于20mil (0.5mm) 或更密的脚距元件，建议减少开口面积，这样有助于减少导致短路的锡珠和桥接现象。开口面积的减少量由具体的制程工艺来确定（一般为5%到15%）。

Fine pitch components: A surface area reduction is recommended for apertures of 20 mil pitch and finer. This reduction will help minimize solder balling and bridging that can lead to electrical shorts. The amount of reduction necessary is process dependent (5-15% is common).

- 建议采用最低1.5的宽深比，以便有足够的锡膏量从钢网的开口中释放出来。宽深比是指钢网开口的宽度与钢网厚度之比。

A minimum aspect ratio of 1.5 is suggested for adequate release of solder paste from stencil apertures. The aspect ratio is defined as the width of the aperture divided by the thickness of the stencil.

印刷参数设置 Printer Operation

- 滚动直径 Solder Paste Bead Size: 20~25mm
- 印刷速度 Print Speed: 25~100mm/sec
- 刮刀压力 Squeegee Pressure: 0.020~0.027kg/mm 刃长
- 擦纸频率: 可达每印10~25片擦拭一次
Underside Stencil Wipe: It can be wiped every 10-25 prints
- 模版寿命: 大于8小时在30~60%RH和22~28°C条件下
Solder Paste Stencil Life:>8 hrs. @ 30-60% R.H. &22-28°C

4. 安全和清洗 Safety and Cleaning

- EcoAPP-NH4无毒性，但在回流焊过程中会产生一些反应性或化合物分解导致的气体。因此建议工作区域内应有良好的通风条件。
EcoAPP-NH4 has no toxicity, however, some reactivity or gases resulting from decomposition of compounds are produced during reflow welding. Therefore, It's suggested that there are good atmospheric conditions in the work area.
- EcoAPP-NH4专为免洗应用设计。如果需要清洗，一般的清洗剂就可以完全清除助焊剂残留。
EcoAPP-NH4 is designed for no-clean applications, however the flux can be removed if necessary by using a commercially available flux residue remover.
- 丝印模板清洗: 推荐使用自动化模板清洗系统，用于模板和印刷失败清洗，以防出现锡珠。大多数模板清洗剂都很有效，例如异丙醇（IPA）。
Stencil Cleaning: This is best performed using isopropyl alcohol (IPA) as a solvent. Most commercially available stencil cleaners work well.

5. 贮存 Storage

- EcoAPP-NH4在0~10°C条件下可保存6个月。在常温下，可保存1个月。注意不要对锡膏进行冷冻处理。
EcoAPP-NH4 has a refrigerated shelf life of 6 months at 0 to 10°C, one month at room temperature. Do not freeze this product.
- 锡膏打开包装使用前需进行充分回温到室温（推荐4个小时）。
Allow the solder paste to warm completely and naturally to ambient temperature (4 hours is recommended) prior to breaking the seal for use.
- 长时间冷藏储存后可能会引起锡膏内组分的分离，使用前应对锡膏进行充分搅拌，手工搅拌2~4分钟，机器搅拌1~2分钟。

Refrigeration may result in the separated materials of solder paste. Thoroughly mix the product for 2 to 4 minutes for manual mixing and 1 to 2 minutes for machine mixing before application.

- 不要将用剩的锡膏与新的锡膏混合在同一包装瓶内。锡膏不需使用时应重新进行密封，当瓶盖不能很好地进行密封保存时请更换瓶盖内衬以保证尽可能的密封。

Do not mix new and used paste in the same container. Re-seal any opened containers while not in use. As the cap of the 500 gram jars is not a seal, replace the internal plug in conjunction with the cap to ensure the best possible seal.

6. 性能规格 Performance and Standard

6.1 焊料的合金化学成份 Chemical composition of solder alloy

Composition / 组成 (mass%)								
Alloy/合金			Sn		Ag		Cu	
SAC305			Balance / 余量		2.8~3.2		0.3~0.7	
SAC105			Balance / 余量		0.8~1.2		0.3~0.7	
SAC0307			Balance / 余量		0.2~0.4		0.5~0.9	
Impurities/不纯物								
Mass% or less/ 质量% 以下								
Pb	Fe	Bi	Al	Cd	Ni	Sb	Zn	As
0.05	0.02	0.05	0.005	0.002	0.05	0.1	0.005	0.01

6.2 化学特性 Chemical Characteristic

测试项目 Test item	结果 Result	参照标准/备注 Standard reference/Notes
助焊膏类型/活性 Flux type/Activity	ROLO	IPC J-STD-004B
Flux卤素含量 Halogen content	No added	EN 14582: 2007
铜镜试验 Bronze mirror test	符合 (L)	IPC J-STD-004B
铜板腐蚀试验 Bronze board erode test	符合 (L)	IPC J-STD-004B

6.3 电性能 Electrical capability

测试项目 Test item	结果 Result	参照标准/备注 Standard reference/Notes
表面绝缘电阻 SIR (IPC, 7days @85°C/85%RH)	PASS	IPC J-STD-004B (Pass means $\geq 1.0 \times 10^8$ ohms)
表面绝缘电阻SIR (Bellcore, 96 hours @65°C/85%RH)	PASS	Bellcore GR78-CORE (Pass means $\geq 1.0 \times 10^{11}$ ohms)
电迁移Electromigration (Bellcore, @65°C /85%RH 10v 500hours)	PASS	Bellcore GR78-CORE (Pass means final > initial/10)

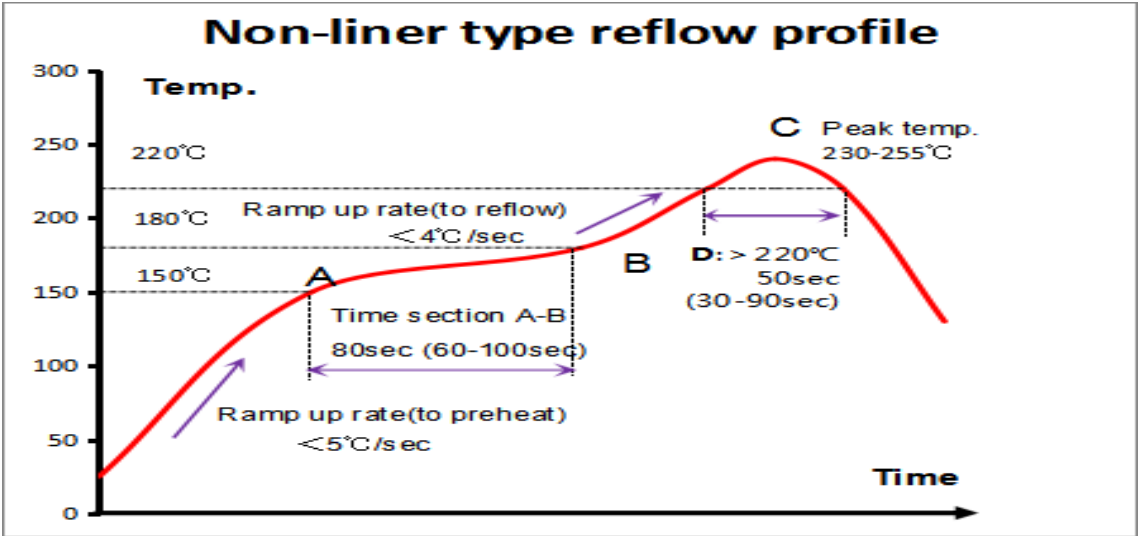
6.4 物理性能 Physics capability

测试项目 Test item	结果 Result			参照标准/备注 Standard reference/Notes
颜色 colour	清澈助焊剂残余 Limpidity flux residue			
粘着力 @湿度 Adhesive force@Humidity (time = 8 hours)	PASS, @25℃/75%RH, 变化<1g/mm²change<1g/mm²			IPC J-STD-005A
	PASS, @25℃/50%RH, 变化<10% Variation<10%			JIS Z 3284
锡膏粘度典型值 Viscosity of printing process	合金型号 Alloy Type	助焊剂含量 Flux content	粘度 Viscosity	@ 10 RPM (Malcom Viscometer @ 25℃)
	SAC305-T4	11.5±1wt%	140-200 Pa.s	
针筒点涂工艺粘度 Viscosity of needle point coating process	按客户要求定制 Customized to Customer Requirements			
锡珠 Solder ball	Acceptable			IPC J-STD-005A
印刷时粘度保持 时间	> 8 hours			@ 50%RH, 22℃

Holding time of viscosity		
铺展率 Coverage	PASS	JIS Z 3197
坍塌 Slump	PASS	IPC J-STD-005A

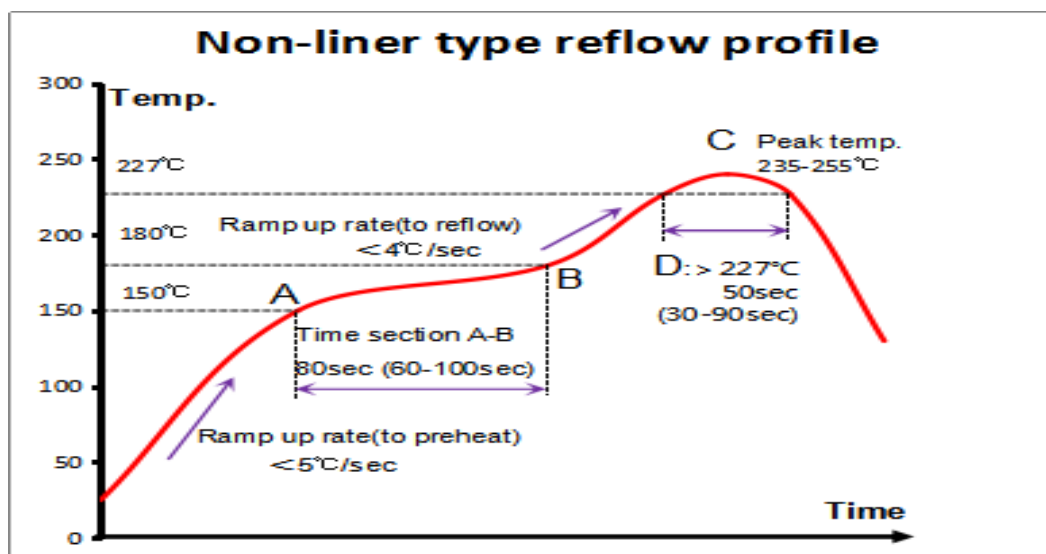
7. 推荐的回流曲线 Recommendation Reflow Profile

SAC305推荐回流焊曲线 Recommendation Reflow Profile



Point		Standard	Upper	Lower
A	Pre-heat start point	150°C	160°C	140°C
B	Pre-heat end point	180°C	200°C	160°C
A-B	Pre-heat time	80s	100s	60s
C	Peak temp.	240°C	255°C	230°C
D	Time above 220°C	50s	90s	30s

SAC105/SAC0307推荐回流焊曲线 Recommendation Reflow Profile



Point		Standard	Upper	Lower
A	Pre-heat start point	150°C	160°C	140°C
B	Pre-heat end point	180°C	200°C	160°C
A-B	Pre-heat time	80s	100s	60s
C	Peak temp.	240°C	255°C	235°C
D	Time above 227°C	50s	90s	30s

注：以上温度曲线为推荐工艺曲线，仅供参考，客户可根据本身的回流炉使用情况以及实际工艺需求做适当调整。

NOTE: The above temperature curve is considered to be a recommended technology one for reference. It can be adjusted due to actual technology demand.

我们认为上述表格及内容数据是准确的。对于数据的准确性，我们不提供明确或暗示的担保。对于因使用本信息或使用指定的材料而造成的损失，我们不承担任何责任。

We believe that the above tables and content data are accurate. We do not provide explicit or implied guarantees for the accuracy of the data. We are not liable for any loss caused by the use of this information or specified materials.