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AN-9076

最新SPM® 2封装安装指南

安装指南

本应用笔记介绍最新SPM® 2封装的电气间距和安装指南。

电气间距

最新SPM 2封装的电气间距规格如 表 1所示。

表 1. SPM 2封装典型电气间距

位置	电气间隙 [mm]	爬电距离 [mm]
功率端子之间	7.80	8.00
控制端子之间	3.05	6.85
端子与H/S之间	3.8	6.06

安装方法和注意事项

在散热片上安装模块时，过强的不均匀紧固力会给芯片内部施加压力，可能导致器件损坏或性能下降。图 1 显示建议紧固顺序。

表 2. 安装扭矩和散热片平面度规格

参数	工作条件		极限值			单位
			最小值	典型值	最大值	
器件平面度	如需相关特性，请参见 图 2		0		+200	μm
散热片平面度	如需相关特性，请参见 图 3		-50		+100	μm
安装扭矩	螺钉： M4	建议0.9 N·m	0.9	1.0	1.5	N·m
		建议9.1 kgf·cm	9.1	10.1	15.1	kgf·cm
重量				50		g

注意：

3. 建议使用螺钉组（包括弹簧/平垫圈、M4）。

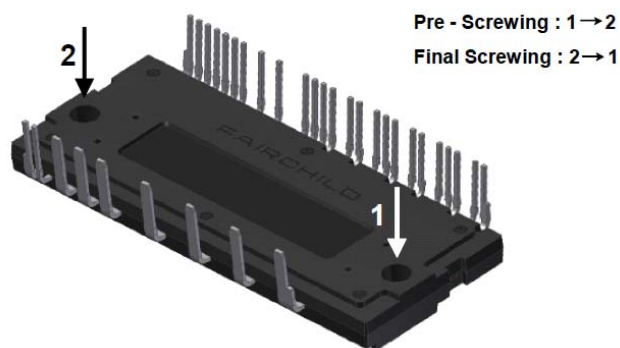


图 1. 安装螺钉紧固顺序

注意：

1. 安装螺钉时请勿施加过大扭矩。扭矩过大可能导致陶瓷开裂，或损坏螺钉和散热片。
2. 避免只固定一侧。图 1 显示安装螺钉时的建议扭矩。安装时用力不均可能会损坏陶瓷基板。预拧扭矩应设为最大扭矩额定值的20~30%。

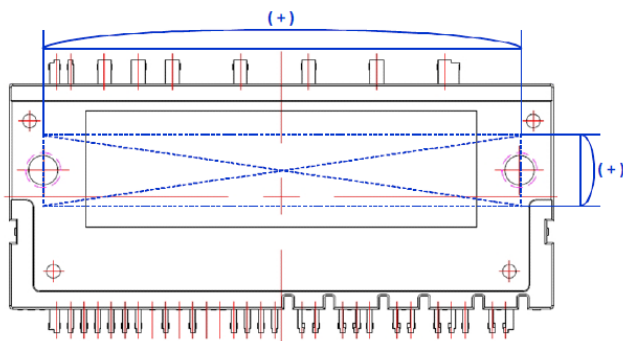


图 2. 封装表面平坦度
测量点

注意:

4. 封装表面的平坦度测量点位于封装中心和四个外角。

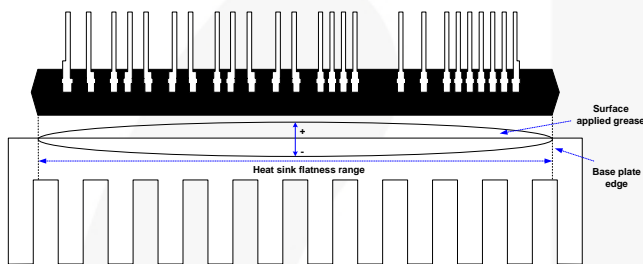


图 3. 散热片平面度的测量点

为了得到最好的散热效果，需要尽可能扩大接触区域，这样才能把接触热阻降到最低。

在模块和散热片之间的接触表面上正确使用导热硅膏。防止接触表面腐蚀也非常重要。另外，确保所用的硅膏质量稳定，可以在较宽的工作温度范围中长时间使用。

相关资源

[FNA41012A](#)、[FNA42512A^{\(5\)}](#)、[FNA42512A^{\(5\)}](#) - 1200-V Motion SPM[®] 2系列

[AN-9075](#) - 1200-V Motion SPM[®] 2系列用户指南

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使用扳手将螺钉紧固至额定扭矩。超出扭矩的最大限值将造成器件损坏或性能下降。小心不要让接触表面沾染任何灰尘或碎屑。

导热组合

- 在模块基板或散热片上使用厚度至少为150 μm的导热硅膏。
- 紧固模块时在安装模块的边缘会看到有一圈导热膏。

紧固顺序

- 以低于1.0 N·m的扭矩固定所有螺钉（用手拧或使用螺丝刀）
- 交叉的施加1.5 ~ 2.5 N·m的冲击扭矩
- 使用推荐的螺钉组（包括弹簧/平垫圈M4）



图 4. 螺钉组

(尺寸M4、弹簧垫圈7.0Φ、平垫圈9.0Φ)

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