

PCB Layout Guidelines for the MC1319x

1 Introduction

This application note describes guidelines for a Printed Circuit Board (PCB) footprint for the QFN32 package used for the MC1319x. Included are layouts of the component copper layer, solder mask, and solder paste stencil. These recommendations are guidelines only and may need to be modified depending on the assembly house used and the other components on the board.

A general description for QFN packages can be found in AN1902 at the Freescale web site:

http://www.freescale.com/files/32bit/doc/app_note/AN1902.pdf

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2 Component Copper Layer

Figure 1 shows a recommended component copper layer. This layer is also referred to as the top metal layer and is the layer to which the components are soldered. The footprint for the QFN-32 package consists of 32 IC contact pads and a centered ground pad. The centered ground pad is partitioned into 9 conjoined pads. There are 0.25 mm via holes through at least four of the center pads connected to the ground plane layers. These are required for RF grounding.

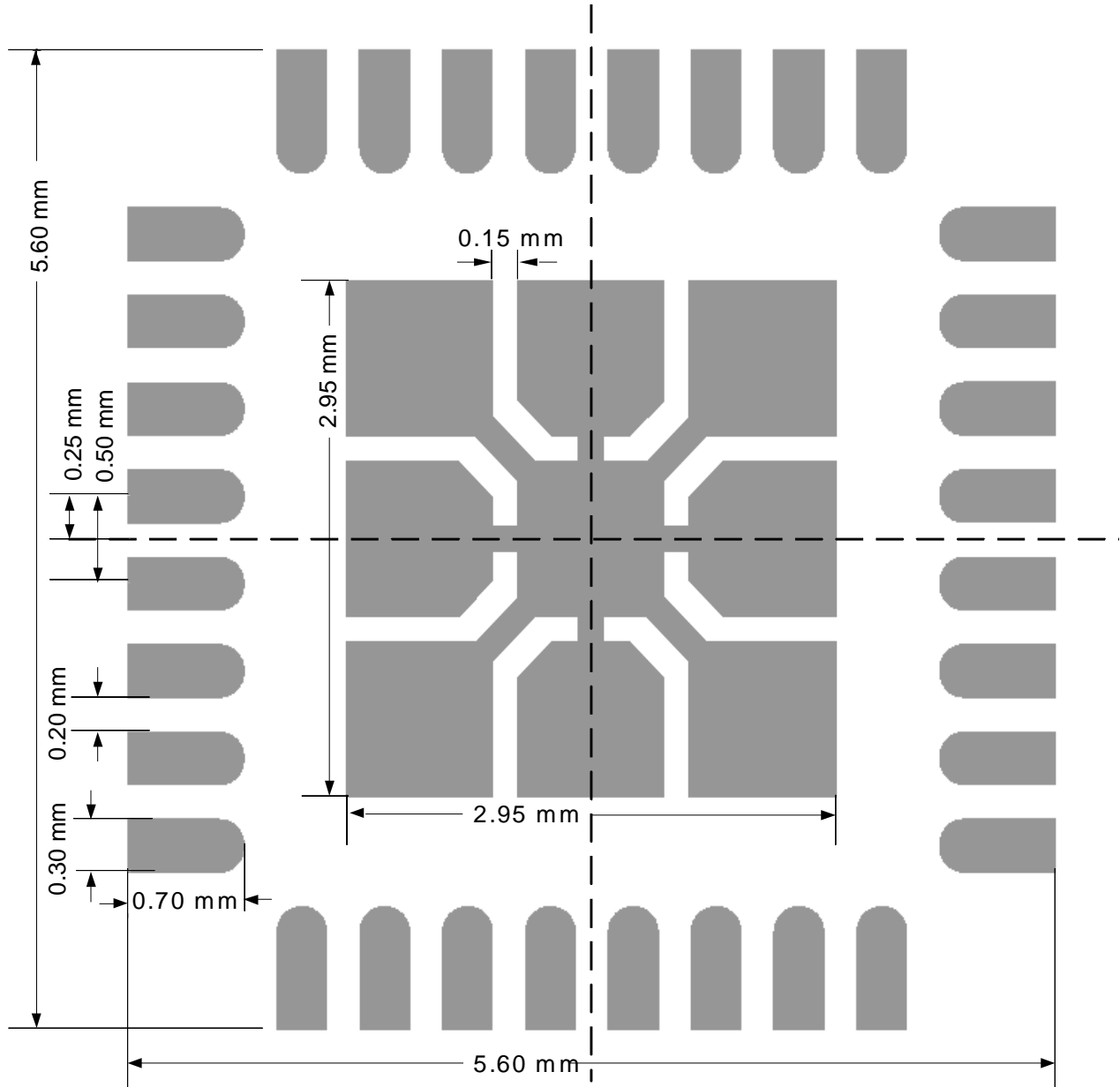


Figure 1. Component Copper Layer

4 Solder Paste Stencil

The solder paste stencil controls the pattern and thickness of the solder paste dispensed on the board. Figure 3 shows a recommended solder stencil pattern. Stencil thickness should be 0.13 - 0.15 mm. Other patterns and opening sizes can be used if too much solder is being applied. See Section 5, "Problems with Excess Solder" for more information.

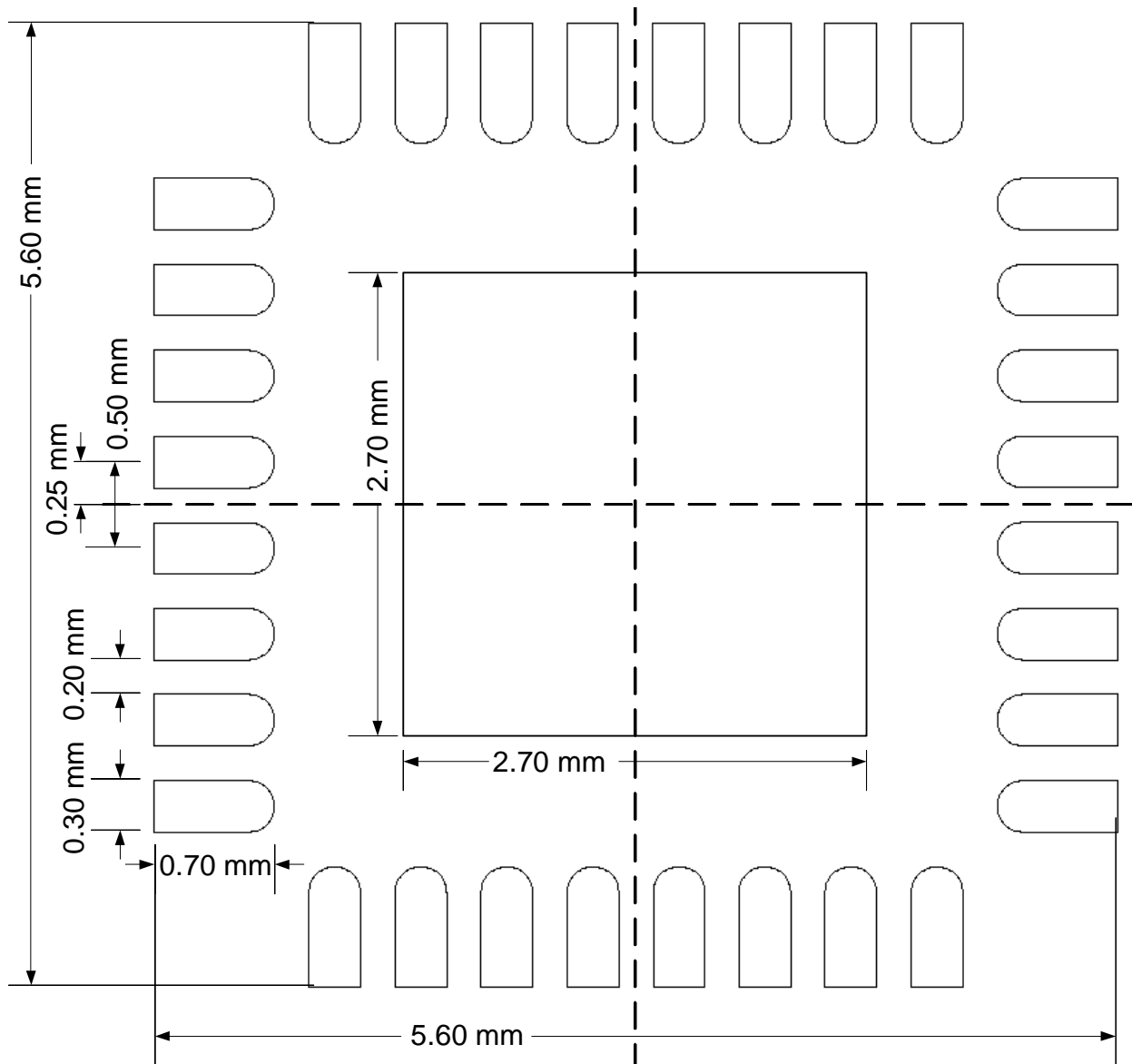


Figure 3. Solder Stencil Pattern

5 Problems with Excess Solder

Excess solder may cause the QFN to “float” or bridge between the package contacts. To use the correct amount of solder paste applied to the PCB, take into consideration the following:

- Stencil thickness
- Other components mounted on the PCB
- Manufacturing equipment
- Assembly house experience

Package floating can be eliminated by reducing the area of solder paste on the centered pad. Figure 4 shows alternative solder stencil patterns to reduce the amount of solder paste applied to the centered pad.

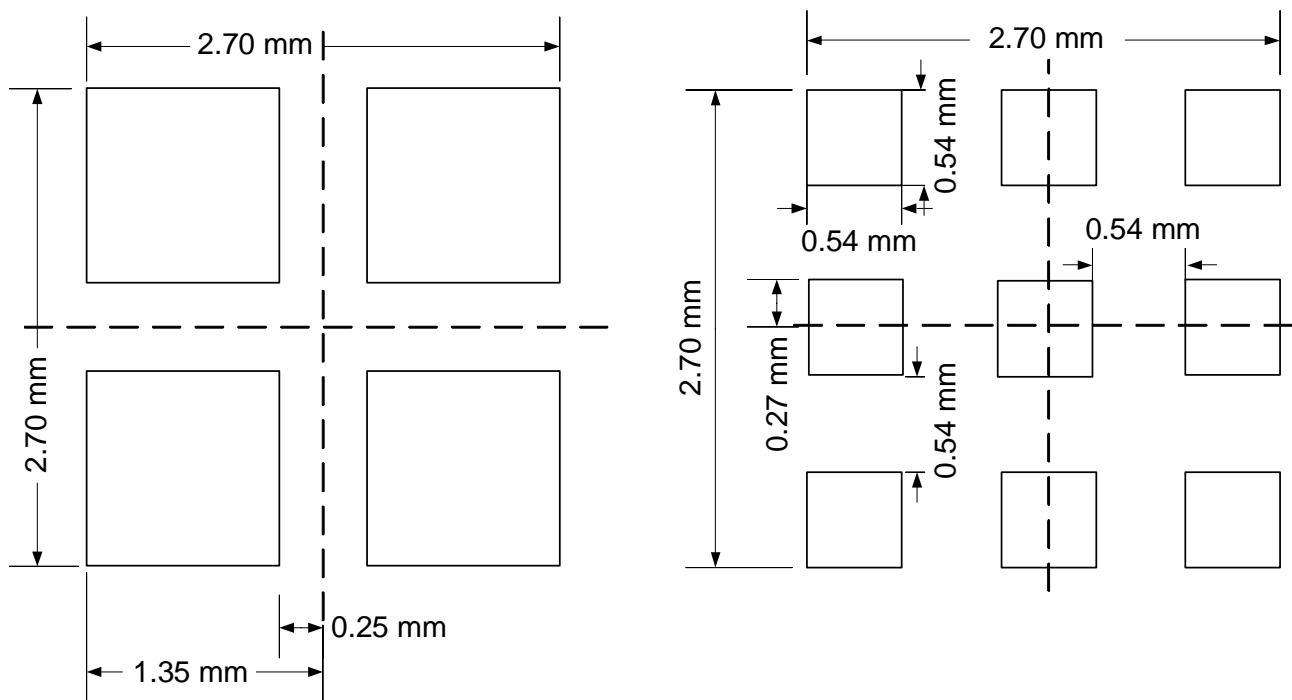


Figure 4. Alternative Solder Stencil Patterns

Solder bridging between package contacts can be reduced by adjusting the metal contact pad widths in Figure 1 from 0.3 mm to 0.25 mm and the solder mask pad openings from 0.5 mm to 0.4 mm. This allows for a 0.1 mm septum of solder mask between the pads. However, this approach may not be feasible for all board houses and may increase assembly cost.



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