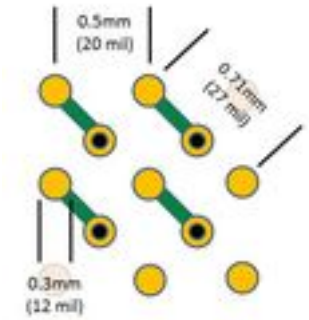
Will a via fit between?

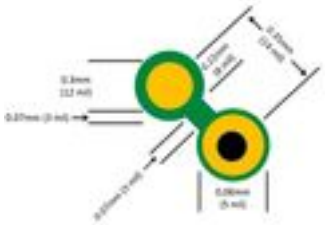
Screaming Circuits

I don't know that it would be accurate to say that BGA's have ever been easy, but with 0.4mm pitch being common and 0.3mm pitch showing up, some of the older size, like a WHOLE millimeter pitch seem



[1]positively spacious. With 1mm and larger ball pitch, putting a via between the pads (not in the pads) is a no-brainer.

IPC-7095B classifies 0.8mm and smaller pitch as fine-pitch. It really starts to get complicated at around that point. For example, take a 0.5mm pitch BGA. Since we're looking to put a via between the pads, the diagonal pitch is the critical measurement. In this case, it's 0.71mm (17 mil). It might immediately seem like that's plenty of room for a 6 mil via, but upon closer examination, not so much.



[2]IPC states that a 0.5mm pitch BGA will have a nominal pad diameter of 0.3 mm. It should be a non-soldermask defined pad, which will add about 0.07 mm to the pad diameter. That gives 0.44 mm total pad diameter. The radius is 0.22 mm (8 mil). Take that out of the 0.35 mm (14 mil) you have to work with and you're not left with much space.

If your fab house can do 3 mil trace and space, you will end up with enough room for a 0.06mm (5 mil) via, including annular ring. That's not much space. Most designers, at that point, will seriously consider putting the via in the land pad and having it filled and plated over. You can't leave the via open or un plated.

Duane Benson
All was in chaos, 'till Euclid arose and made order

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