Let's get small, as in 0.3mm

Screaming Circuits

Not long ago, I wrote [1] about a 0.3mm pitch wafer scale BGA we received and were asked to place. The gist of that article was that those parts are very small and we d0n't yet have a process that we feel will give the quality, reliability and consistency that we want to deliver. That means officially, we don't, at the moment, support that form-factor.

However, as it turned out, we went ahead and built it and the x-rays all said it looked good. Whew! We still don't officially support it, but we're working on it. If you have one of these things, you can always give us a call and see if it's something our manufacturing engineers are comfortable with. If they say "sure, send it in", It will be a non-standard, essentially, experimental, operation so our normal guarantees won't apply. It will be "we'll do our best."

But that's not the point. The point is that there are still a number of unanswered questions with 0.4mm pitch, and now we have a smaller one??!!

I've only seen 0.3mm pitch in two places: some data from Amkor, and the data sheet for this part.The part in questions is a Maxim MAX98304 Mono 3.2 Watt Class D amplifier. The entire package is just 1mm x 1mm.

There is still a lot of difference of opinion on solder mask defined (SMD) vs. non solder mask defined (NSMD) at super small pitch like this. For BGAs 0.5mm and lager, the general consensus and IPC recommendation is NSMD. At 0.4mm, the Beabgleboard folks at Ti recommend SMD to reduce bridging. But I've had other folks say they get good results with NSMD. For 0.4mm, we've had best results with SMD. It's more than just that though, you also need to religiously follow the manufacturer's recommended pad sizes and such.

For this part, the datasheet shows the pad size (0.18mm), but doesn't cover the SMD vs. NSMD question. Instead, it refers to a Maxim app note (#1891) for that bit of information.

Of course, this is where it gets sticky. That app note, as of this writing, shows 0.5mm and 0.4mm, but no 0.3mm. It does reference IPC-7351, which is a very good thing, but I don't think IPC-7351 has 0.3mm pitch covered yet. Ugh. The 0.3mm part we soldered on used SMD pads.

Duane Benson
It's not just Facebook where you can designate something: "It's complicated."

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