SOLECON LABORATORIES INCORPORATED

Some Helpful Information

Whenever possible, please try to remove the silicon nitride passivation. Nitride is very hard and brittle and slows down the beveling. More important is that it tends to gouge and scratch the beveled surface we are trying to prepare. This leads to very noisy profiles, if we can obtain any useable profiles at all.

Only the top passivating nitride needs to be removed. Thin nitride films (under 1000Å thick) and any metal or oxide films may remain. However, be careful when removing the passivation so you do not etch the silicon in the SRA test bars.

When you are considering a new mask layout and want to incorporate SRA test patterns, please give us a call and we will be happy to discuss the layout with you. If the test die, which contains the SRA test patterns, is the same size as the product die, please orient the test structures such that the length runs parallel to the longest side of the product die. This is very useful when we are asked to analyze the structures after the wafer has been die scribed or sawed.

Whenever possible, please consult with us if you are planning a large matrix process experiment. We may be able to provide some useful information before you begin and also discuss what type of results and or problems we may encounter during the analysis.

Many times it is useful to analyze only three or four samples from different parts of the matrix and then review and discuss the results to see if they are meaningful. We suggest this as opposed to sending us 30 or 40 samples and analyzing them all. Chances are that if we are not pleased with the results, you won't be either.

Profiling Small Device Dice

We can get useful information from small device die, such as photodiodes, if they are around 500 microns square. Keep in mind, that if it is necessary to profile the shallow layer in the photo detector area and also to run a deep profile for the epi substrate information, two bevels will be needed. It is easier to prepare these types of samples if they are in wafer form, but if that is not possible, we suggest providing as many spares as possible.

Technical Seminars On Spreading Resistance Analysis

We have done on-site seminars for many of our customers. They are no charge to you and are designed to answer the many technical questions that arise from new or experienced users.

If you are interested, please contact Sheila Loftis at 775-853-5900 or sheila@solecon.com for details.

Jambalaya

Serves 8-ish

1 lb	Ham, cubed
1 lb	Smoked Andouille sausage *, sliced into coins
1 lg	Onion, chopped
½ cup	Green bell pepper, chopped
½ cup	Fresh flat leaf parsley, finely chopped
2 ribs	Celery, finely chopped
5 cloves	Garlic, chopped
1	14 oz can diced tomatoes, juice included
1 tsp	Dried thyme
2	Bay leaves
2 cups	(jasmine) long grain rice

2 ½ cups chicken stock (low sodium) salt and pepper to taste, for more kick, use a little Cajun Fairy Dust from the accompanying recipe.

In a heavy bottom skillet with a tight cover, cook over medium high heat, add a little oil, brown the ham, set aside and brown the sausage, discard the excess drippings. Add a little red drinking wine to the pan and scrape the pan bottom (reduce and pour back into the pan when you add the stock). Use a little oil and add onion, stir over medium heat until limp. Add green pepper, parsley, celery, garlic, tomatoes, thyme and bay leaves. Season with salt and pepper, cook stirring for about 5 minutes, or until the veggies soften, add the rice and 2 ½ cups chicken stock, return meat to pan, cover and set over low heat to simmer for 25-30 minutes. Keep covered until dish is done. The dish is done when the rice is tender and all liquid is absorbed. Fluff with a fork and serve.

*I like to use Cantella's brand chicken Andouille sausage which I can usually find at the local Trader Joes.

Cajun Fairy Dust

Makes about 1/3 cup of spice mix

1 tblsp	Paprika
1 tblsp	White Pepper
1 ½ tsp	Cayenne pepper
1 ½ tsp	Chili Powder
1 tblsp	Black Pepper
1 ½ tsp	Onion powder
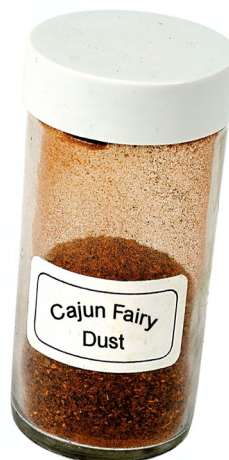
Pour each ingredient into a small tin spice can, or glass jar, shake well, and enjoy as a rub for steak or foul. Sprinkle on raw veggies, French fries or as a replacement for anytime you might use regular black pepper. Sneak into your next Bloody Mary or, try on grits with a pad of butter! Whoo-Hah!

Enjoy!   Submitted by *Augy Augenstein*

One of the real fun activities is going to a customer's facility and giving a technical seminar on spreading resistance. After presenting it at least 50 times, I got called on an item--and I thank the person who asked the question. But I'm getting ahead of the story. Here's some background.

We start our description of how SRP works by introducing a cylinder and explaining that if we make very good electrical contacts to its ends, we will measure a resistance proportional to the length and resistivity, inversely proportional to its cross-sectional area. Here are the drawings we use:
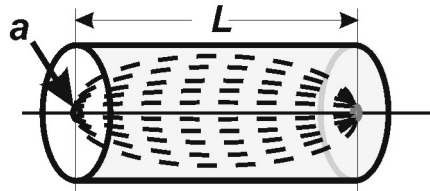
LINEAR CURRENT FLOW

$$R = \frac{\rho L}{\pi r^2}$$
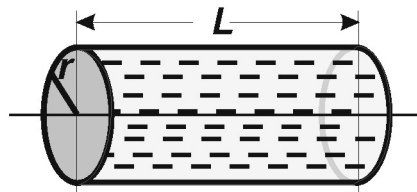
where ρ is the bulk resistivity in ohm-cm

SPREADING RESISTANCE

$$R = \frac{\rho}{2a}$$

where a is the radius of the contact area

We go on to explain that if we reduce the contact area at each end the resistance increases considerably. If reduced adequately, the resistance approaches $R = \rho/2a$ as a limit (where a is the radius of the contact). ($R = \rho/2a$ has been credited to Maxwell by at least one writer. I'm still trying to track the references.)

Then comes the question from the audience: "JUST HOW MUCH IS THE RESISTANCE INCREASED?" My response was "orders of magnitude" but frankly, I had yet to do the calculation having newly arrived in this business a mere 26 years ago.

Okay, so let's do a quick calculation. Say the resistivity is 1 ohm-cm (doesn't make any difference). Let's say the cylinder has a diameter of 2 cm and a length of 3.14 cm. If you plug those values into the top equation ($R = \rho L/\pi r^2$), you get a resistance of about one ohm. For a lightly loaded probe, you get about 27000 ohms and for a heavily loaded probe (21 grams), you get about 8000 ohms. So for the cylinder size selected, the difference in measured resistance between a very small contact and the entire cylinder end having ohmic contact is about four decades--large indeed!

DID YOU EVER WONDER WHY?

A person who peeps through a window is called a "peeping Tom"

Before Lady Godiva made her famous ride through the streets of Coventry, England, she issued a proclamation asking that all of the townspeople remain indoors and keep their shutters closed during the ride. Everyone complied with her request except for Tom, the tailor. Tom bored a small hole through his shutter so that he could take a peek, and ever since that day has been known as Peeping Tom of Coventry. This, of course, is why peepers today are called "peeping Toms."

Golfers shout "fore"

"Fore" originally meant "get out of the way or you'll be shot". It is an old military term once used to warn the front row of riflemen to kneel down so that the second row could fire over their heads. The term was originally "Beware before", then it became "before" and finally it was shortened to just "fore".

Pah-lease! Do not ship us half wafers in big cassettes without immobilizing them completely.

If you allow them to move about, they will arrive at our place as a pathetic mix of pieces.

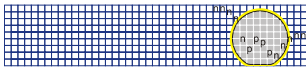**"Behold the turtle. He makes progress only when he sticks his neck out."**

James Bryant Conant

"You can't build a reputation on what you are going to do."

Henry Ford

"If you want to see what children can do, you must stop giving them things."

Norman Douglas

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