

REPORT: Edge trimming of SiC chip by Laser-MicroJet®

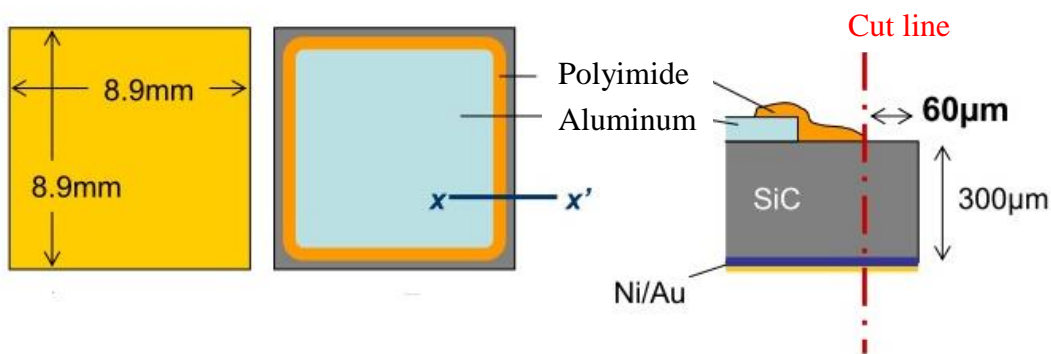
for Anonymouse

by Masaki Takano, Synova SA

TASK

The Laser-MicroJet® technology has been tested for edge trimming of SiC chip.

The target is to cut the SiC as close as possible to polyimide.



SAMPLE DESCRIPTION AND PREPARATION

SAMPLE	Material	SiC
	Dimension	8.9x8.9 mm
	Thickness	300 µm
	Quantity	5 pcs

Release of application report			
Project Leader		Responsible Application Group	
Name:	Masaki Takano	Name:	Benjamin Carron
Date:	2012.03.19	Date:	2012.03.19
Visum:		Visum:	

PROCESS: INSTRUMENT & TEST PARAMETERS


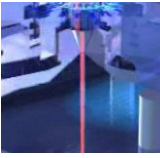

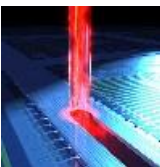
For these experiments, the LDS300 equipped with a green laser has been selected as the most suitable machine configuration.

It is a fully automatic cassette-to-cassette clean-room compatible machine, allowing to cut, drill, groove, scribe, trench, mark, or grind wafers of any kind of semiconductor material.

Major advantages of Laser-MicroJet® technology with regards to your application are:

- Cutting of arbitrary shapes
- No chipping on front side, minimal chipping on backside
- Negligible heat damage to the material
- Parallel and smooth cut walls
- No slag/burr formation
- Excellent wall surface quality
- Parallel cut

In the table below, the optimized processing parameters used in the experiments are summarized:

	SYSTEM	Machine type	LDS300
	MICROJET® PARAMETER	Nozzle diameter	30 μm
		MicroJet® diameter	24.9 μm
		Water pressure	400 <i>bar</i>
		Assist gas	He
	LASER PARAMETER	Laser type	L101G
		Wavelength	532 <i>nm</i>
		Pulse frequency	20 <i>kHz</i>
		Average power	20 <i>W</i>
	CUTTING PARAMETER	Cutting speed	50 <i>mm/s</i>
		Number of passes	20
		Overall speed	2.5 <i>mm/s</i>
		Tape	D520T

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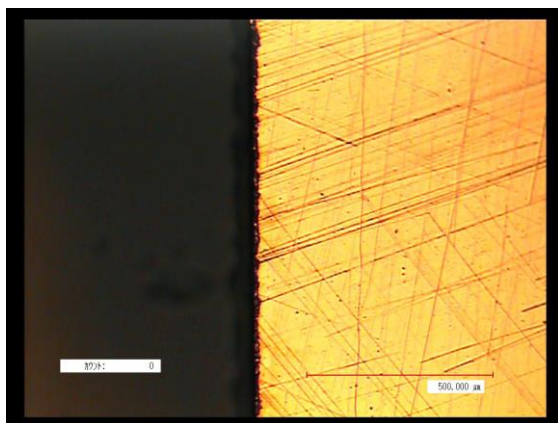
RESULTS



PICTURE: Microscope image of SIC after processing (bright field illumination; top view)



PICTURE: Microscope image of SIC after processing (bright field illumination; top view with high magnification)



PICTURE: Microscope image of SIC after processing (bright field illumination; back view)

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- The table below summarized the customer requirements and our expectations.

	What are your priorities? (please put a cross)	Quantified expectations or improvements
• Other 1 :	No delamination of the polyimide	No delamination
• Other 2 :	Improve the electrical characterization.	Not measured yet

CONCLUSION

The SiC sample was investigated on SYNOVA LDS300 machine. This machine is based on the MicroJet® technology and combines the advantages the high energy pulsed laser with a hair-thin water jet.

We could obtain a good quality on the kerf edge of SiC.

- Delamination of the polyimide : No delamination
- Edge quality: very good. No chipping and sharp edge.

We thank you for your interest in our technology and we hope our results meet your requirements. Our sales will contact you soon to obtain a feedback about the analysis of these results and to discuss with you the further steps.