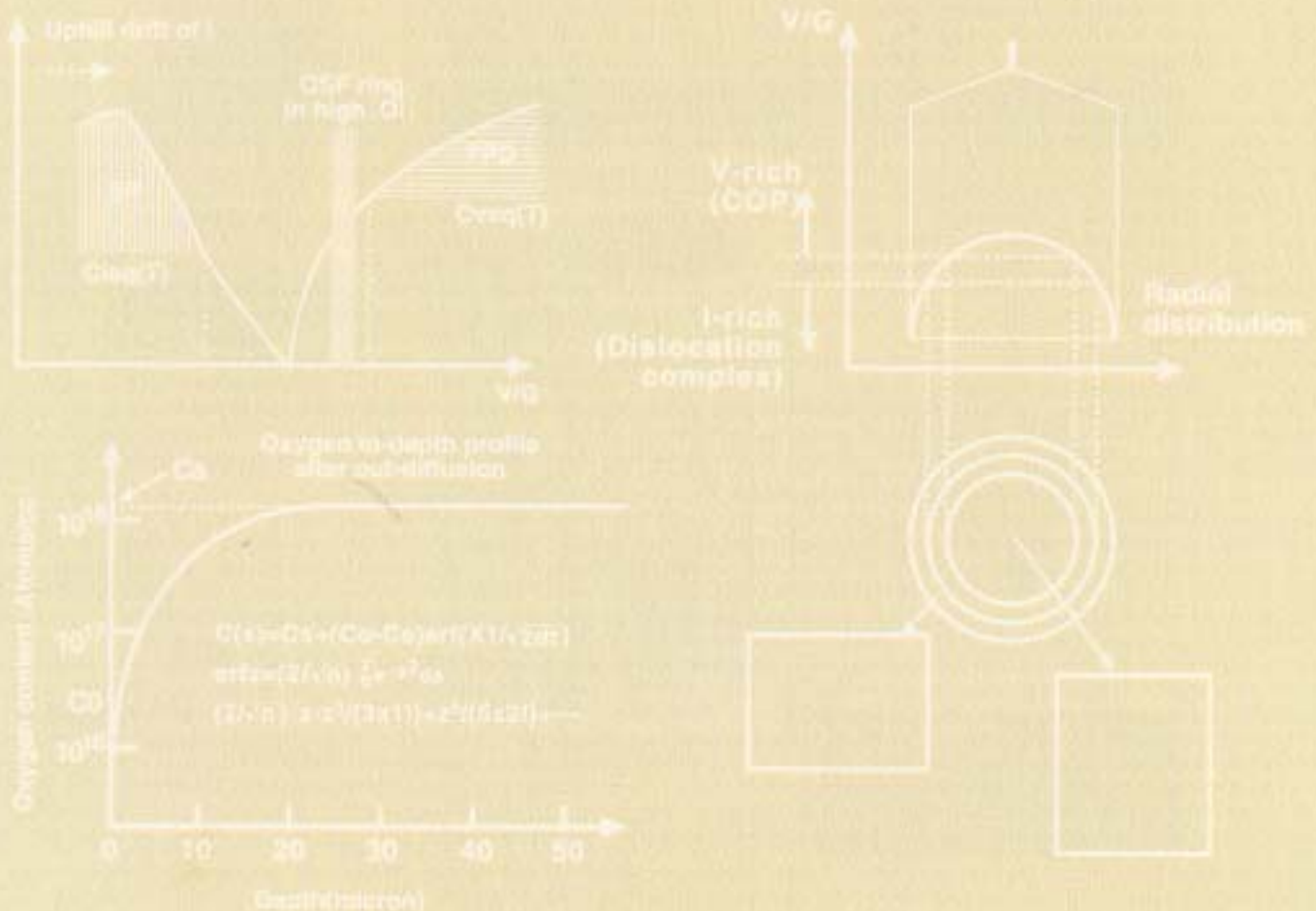
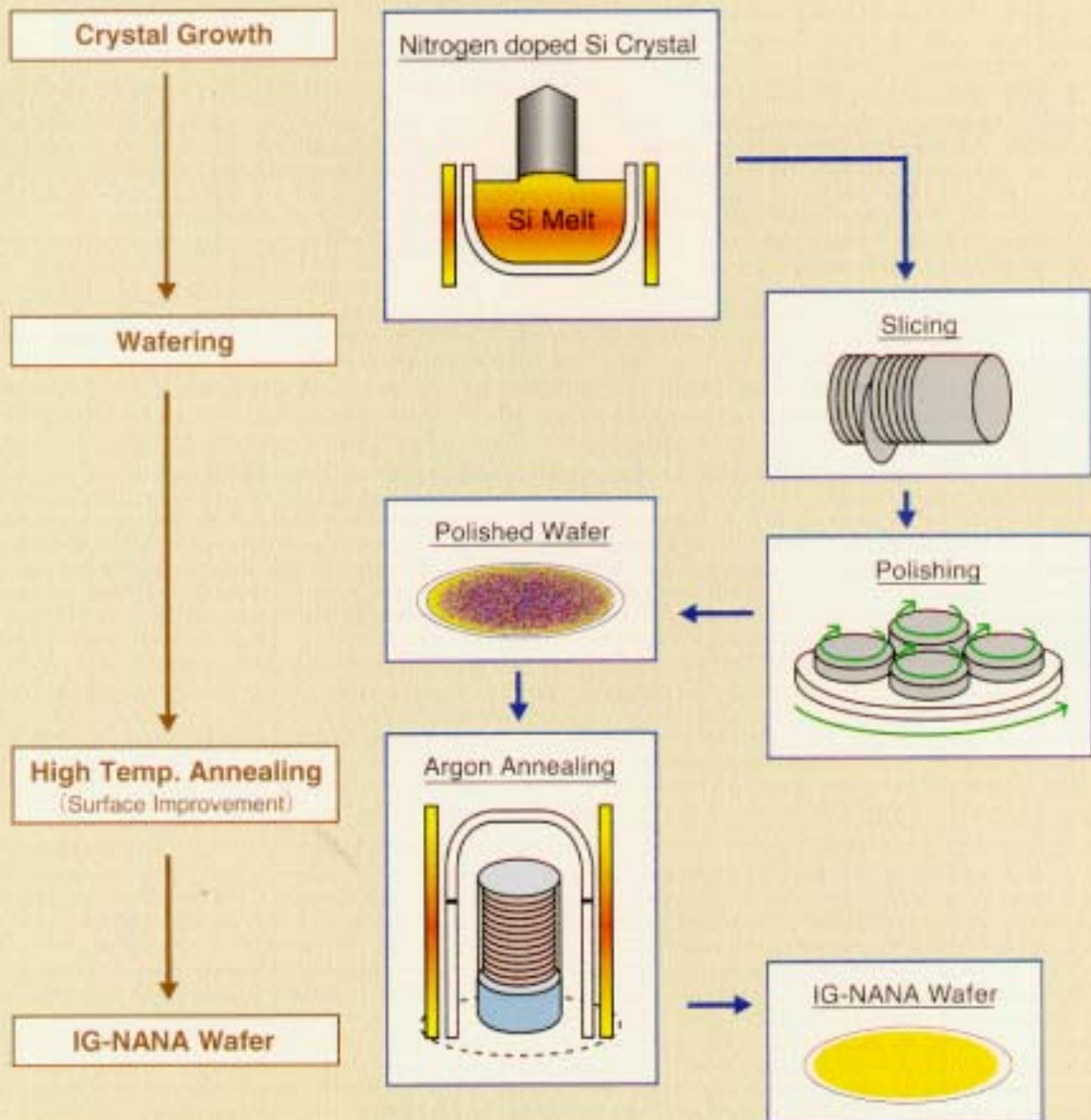


IG-NANA

The best of GOI / COP free / Gettering



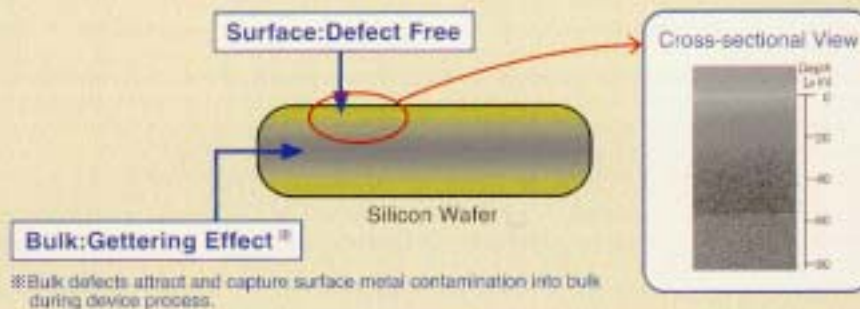
Process Flow of IG-NANA Wafer



IG-NANA Wafer

High performance and Cost-effective Wafer.
The best starting material for variety of device process including Low Thermal Budget.

Summary

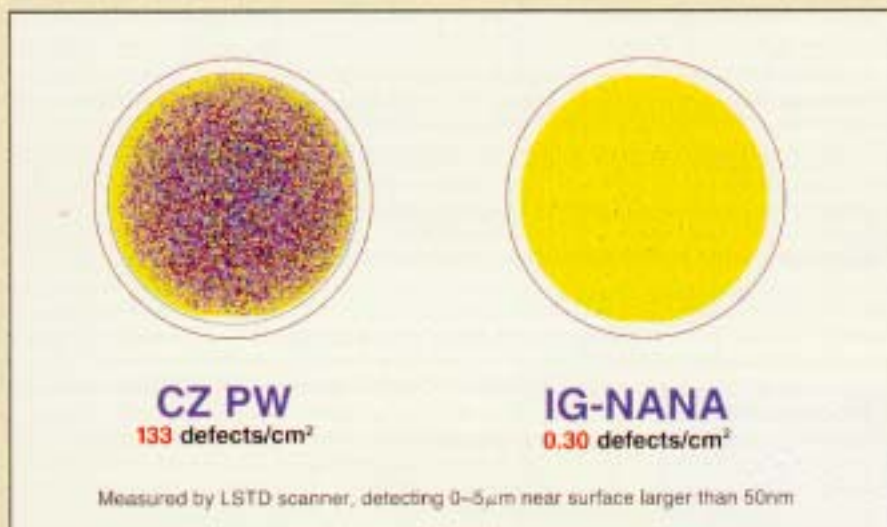


	IG-NANA	Thin Epi	CZ/RTA	HAW	Pure	CZPW
Surface Defect & COP	Excellent	Excellent	Good	Good	Excellent	Fair
Gettering Performance	Excellent	Good	Good	Fair	Fair	Fair

150~200mm wafer : Mass production

300mm wafer : Under development and sample-scale production

Perfect Denuded Zone





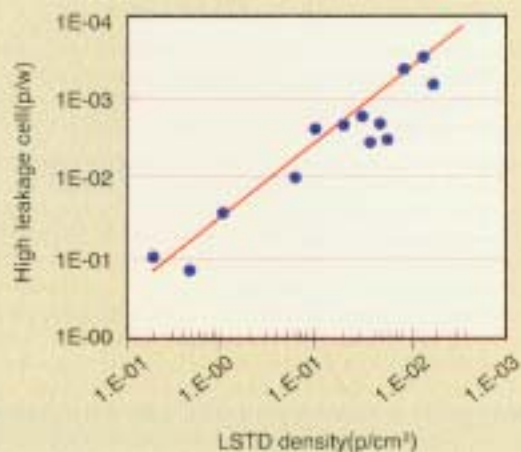
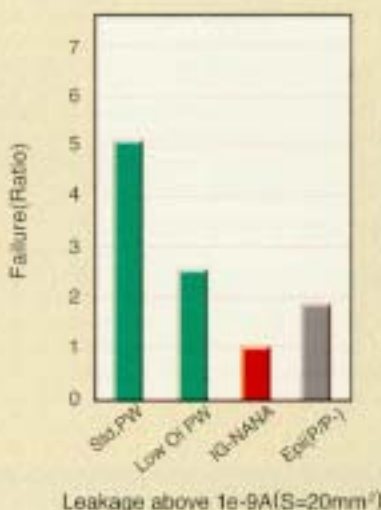
IG-NANA

The best of GOI / COP free / Costing

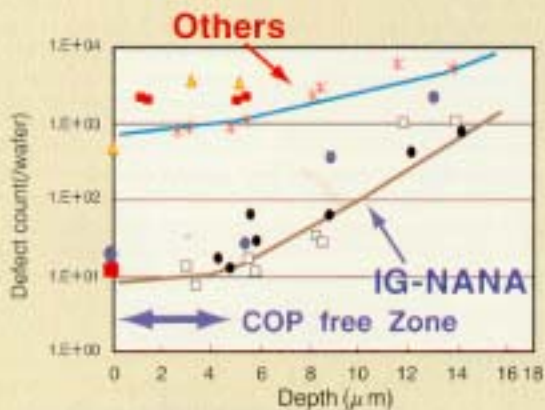
High Performance for Junction Leakage

Correlation between the number of high leakage cell and LSTD density

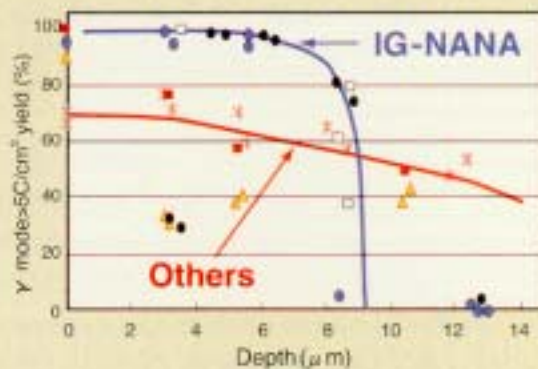
(Source:H.Kubota, et.al.,E.C.S. Proceedings Vol.2000 -17)



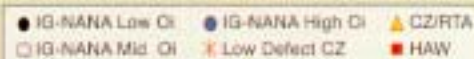
Deeper COP free zone



Deeper high TDDB zone



after Low Thermal Budget process measured by Shin-Etsu STD method



What is NANA?

NANA means "7" in Japanese. This is the atomic number of Nitrogen.
The NANA is symbolic of nitrogen doping technology.

●NANA technology is the solution for achieving

- 1.The higher gettering performance by BMD
- 2.The perfect Denuded Zone for device region

●Shin-Etsu Handotai (**SEH**) provides two types of NANA wafers,

IG-NANA / EP-NANA

to satisfy all requirements in sub-0.25 μ m device generation and beyond.

Development History

Gettering Problems

1977 Invention of Intrinsic Gettering (IG)

1983 ~ Development of DZ-IG wafer

1993 ~ Gettering trouble due to lowered Oxygen

1994 ~ Increasing need for P/P- Epi wafer to avoid COP

1995 ~ Problem due to poor gettering ability of P/P- Epi

2000 ~ SEH IG-NANA for ultimate solution

1997 Evidence of residual COPs on hydrogen annealed wafer

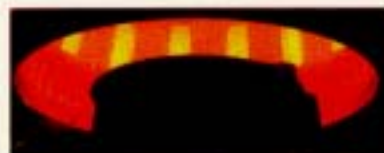
1991 ~ Development of hydrogen annealed wafer to avoid COP

1991 Device failure due to COPs with shrinking design rule

1990 Discovery of COPs as a grown-in defect

1983 ~ GOI problem due to Grown-in Defects

COPs Problems



Precaution

All data presented in this catalog may not be relied upon to represent standard values. Shin-Etsu Handotai reserves the right to change information in this catalog, including product performance standards and specifications, without notice.



Users are solely responsible for making preliminary tests to determine the suitability of products for their intended use. Statements concerning possible or suggested uses made herein may not be relied upon, or be construed, as a guaranty of no patent infringement.



IG-NANA and EP-NANA are trademark pending.



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