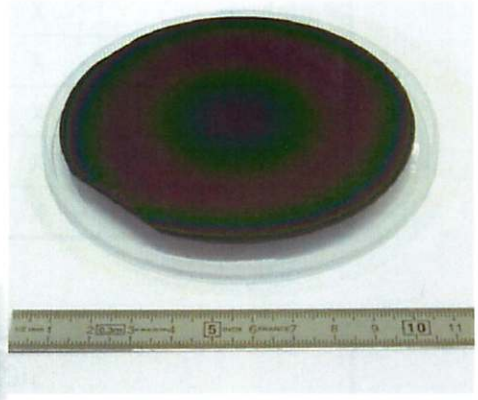
Heteroepitaxial cubic SiC layers on silicon.

Material specifications

Substrate[1]	Si, SOI	
Orientation	(100)	(111)
Substrate diameter	100mm	100mm
Other substrate properties (thickness, resistivity, miscut ...)	Following the client's request	
Layer	**3C-SiC**	
Orientation	(100)	(111)
Thickness range[2]	0 – 20µm	0 – 1µm; Cracks >1µm
Thickness variation[2] (σ/mean)	≤ 10%	
Electrical conductivity	n type	
Unintentional doping[3] (N_D-N_A)	≤ 1×10^{16} cm^{-3}	
Al incorporation[4]	≤ 1×10^{15} cm^{-3}	
Voluntary doping	Nitrogen	
Doping range [3][4]	1×10^{16} – 1×10^{19} cm^{-3}	5×10^{16} – 5×10^{18} cm^{-3}
Doping variation[3][4] (σ/mean)	≤ 50%	
Protrusion density[5]	≤ 3×10^{3} cm^{-2}	
Other services – on client's request		
Epiwafer polishing	Frontside: 1Å<RMS roughness <10Å[6]. Backside: Optical.	
Detailed report on the layer properties	FTIR, XRD, SEM and AFM results[7]	



1) If necessary, wafers may be supplied by NOVASiC
2) Detailed thickness profile obtained by FTIR spectrometry
3) Carrier concentration calculated from C-V measurements
4) Dopant incorporation deduced from SIMS measurements
5) Microscopic inspection of crystallites or other macro-defects
6) Polishing under development for 100mm (111) oriented epiwafers.
7) SEM images on 2'' and 3'' wafers

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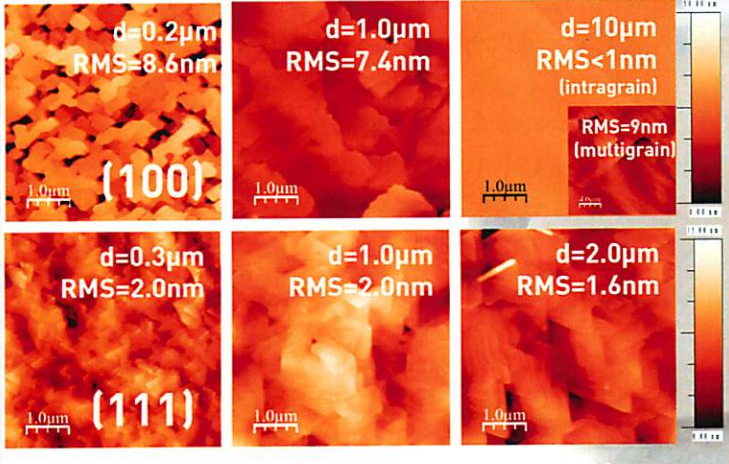
Polished 3C-SiC layers

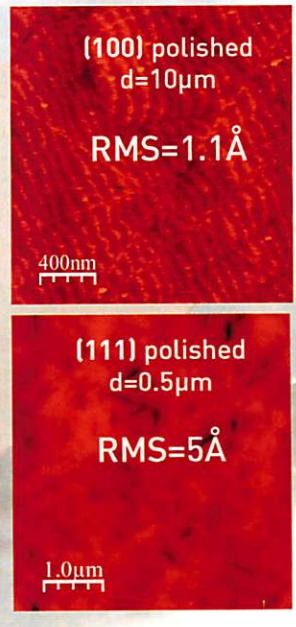
Best surface preparation before further processing

As-grown morphology – rough surface

Growth mode (3D islands) is at the origin of rough surfaces of as-grown (100) and (111) oriented 3C-SiC *on-axis* layers.



Polished film – low roughness



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Available services

	SiC	AlN	GaN	Al_2O_3	ZnO	Ge, CdTe, SiGe silica....
Polishing	X	X	X	X	X	X
Reclaim	X	X	X	X	X	X
Thinning	X					
Planarization	X	X	X			
Epitaxy	X					

Surface quality

	SiC							Other materials						
	4HN - 4HSI On-axis to 8° off		6HN - 6HSI On axis to 8° off		4H – 6H a- & m-plane	3C		Al_2O_3 c- & r-plane	ZnO		AlN		GaN c- a -& m-plane	
face	Si	C	Si	C	N/A	(100)	(111)	N/A	Zn	O	Al	N	Ga	N
RMS (Å)	< 1 *	< 1 *	< 1 *	< 1 *	< 1 *	< 2 *	< 7	< 2 *	< 1 *	< 1*	< 3	-	< 2 Depending on orientation	1

* : with atomic steps

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Please feel free to contact us for any further information you may need.

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