

## ALUMINIUM NITRIDE TEMPLATES - SILICON

### SINGLE CRYSTAL Quality

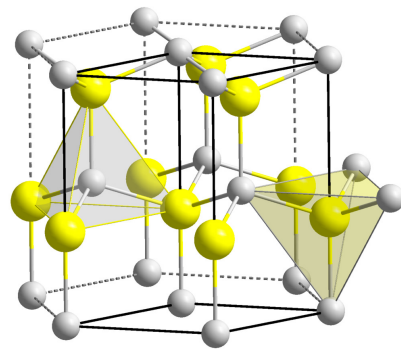
#### GENERAL DESCRIPTION

High quality Gallium Nitride (GaN) substrates on silicon substrates are required to mass produce optoelectronic and electronic devices such as high frequency transistors (HEMT).

Starting point could be a template generated in a MOCVD reactor with the disadvantages of high costs, limited purity, reduced reactor capacity for generating active layers and parasitic layers at the interface of silicon to aluminium nitride start layer. Alternative are AIXaTECHs SINGLE CRYSTAL templates. A thin layer of single crystalline AlN guaranteeing an ideal crystal and thermal match is the ideal starting layer for all demanding opto- and electronic components. The excellent price performance ratio due to AIXaTECHs patented technology makes AIXaTECH sapphire templates also the ideal choice for standard components. Moreover single crystal AlN is also the ideal material choice for bulk acoustic wave filters (BAW) in the 5G surrounding.

#### ADVANTAGES

- optimum crystal match
- optimum thermal match
- no parasitic layers at interface between AlN and Si
- stress-free wafer due to low temperature process
- elimination of long MOCVD or MBE undoped buffer growth
- optimum price-performance ratio
- prevention of nucleation layer
- excellent surface quality
- highest dimensional flexibility



#### SERVICE

- Aside our standard template specification we offer customized designs to meet your specific requirements.
- We offer the templates in any diameter or form required.
- We offer small batch numbers at attractive prices for initial tests.



#### QUALITY

The single crystalline structure of AIXaTECHs templates is an inherent guarantee for highest purity as well as for the ideal crystal and thermal match. Nevertheless AIXaTECH uses latest technology like X-ray deflection to monitor and analyze consistently the status of its manufacturing processes and to inspect the generated layer structures. We want to make sure that we are able to keep AIXaTECHs promise – SINGLE CRYSTAL quality with an excellent price performance ratio.

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### SINGLE CRYSTAL Quality

#### SPECIFICATION

SC - SINGLE CRYSTAL Templates		AIX-SC-AIN-SI-X
Conduction type	[-]	Semi -insulating
RMS (front surface)	[nm]	< 0.5
RMS (back surface)	[nm]	DSP or SSP from substrate vendor
Film thickness	[nm]	30 ... 2000
Substrate material	[-]	Silicon [1,1,1]
Macro defect density	[cm <sup>-2</sup> ]	< 3.0
Wafer size	[mm]	50.8 - 300
Useable surface area	[%]	> 95
Edge exclusion area	[mm]	Semi-standard
Package	[-]	Wafer box

- X: Instead of X please add in your order P for PRIME quality grade or B for BASE quality grade.
- RMS (front surface): Value is measured for a layer thickness of 150 nm on silicon.
- RMS (back surface): Surface quality as delivered from substrate vendor or as supplied by the customer.
- Wafer size: Beyond a round geometry AIXaTECH is capable to supply AlN layers on substrates with any shape.

#### OPTIONS

SC - SINGLE CRYSTAL Templates	
Dimension	AIXaTECHs patented manufacturing technology offers the possibility to supply templates in any size and geometry. However the typical diameter range reaches from 2" to 300 mm.
Layer thickness	The standard thickness of AIXaTECHs AlN layer is 150 nm. However AIXaTECH is capable to customize the layer thickness according to your specific needs.

#### QUALITY STANDARDS

SC - SINGLE CRYSTAL Templates	
SC - PRIME	Due to the single crystalline structure of AIXaTECHs layers we are able to supply templates with very high purity, idela crystal and thermal match - the <b>SINGLE CRYSTAL PRIME</b> series. This quality standard will only be provided for serial manufacture.
SC - BASE	AIXaTECH <b>SINGLE CRYSTAL BASE</b> series is optimized for small series manufacture in research.