OXFORD INSTRUMENTS

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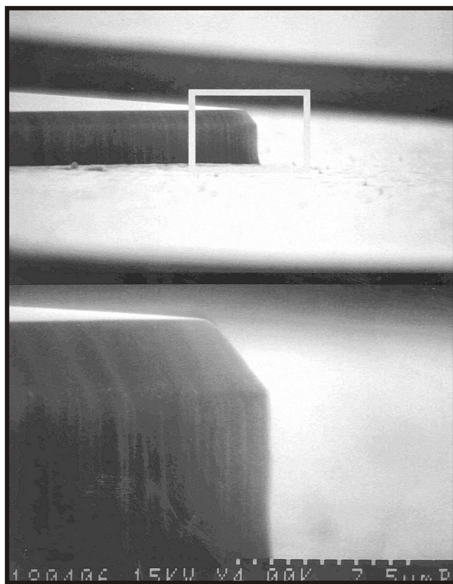
Plasmalab Data

RIE of GaN based structures for optoelectronic applications



Courtesy of Infineon Munich
Z T KM 4 (Dr. G. Franz)

GaN mesa etch formed by RIE,
Al_2O_3 mask has not been removed.

Process Technology:
13.56 MHz Reactive Ion Etch
Single wafer or batch loading
BCl_3/Cl_2 based chemistry for high rate and excellent mask selectivity

Typical Results:
Etch rate: > 150 nm/min
Uniformity: <$\pm$ 2% (2“ wafer)
Selectivity to SiO_2; > 10:1
Al_2O_3; > 10:1
PR: ~ 1:1

Profile control: 85° (Hard mask)
Smooth etched sidewalls suitable for laser facet formation

KEY PROCESS FEATURES

BCl_3 based
Ensures high rates, grass-free surfaces and excellent profile control

Broad process control range
Selective and non-selective processes available for ternary and quaternary layers by addition of other process gases

Clean process chemistry
No polymer forming chemistry ensures high system up time.

In-situ chamber cleaning
High efficiency chamber dry etch back developed to minimse downtime

Low damage process
Smooth sidewall etch can be used to form integrated laser facet.

Plasmalab System 100

Plasmalab System 133

Plasmalab 80 Plus