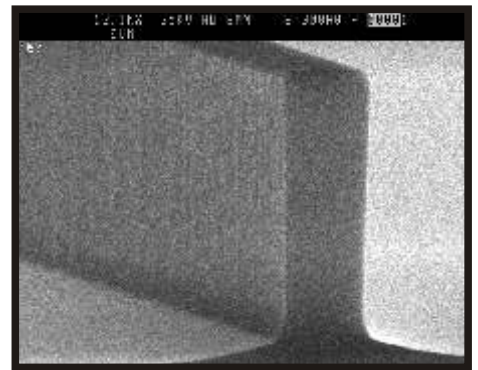
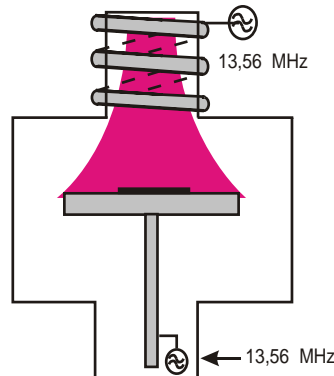
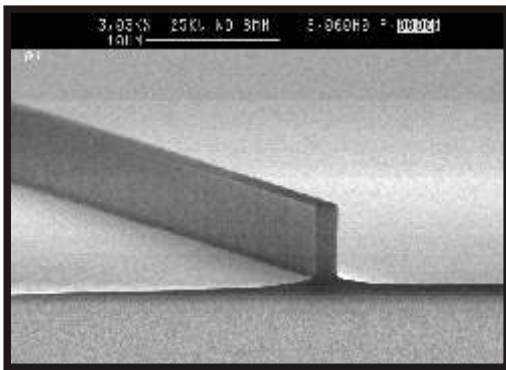


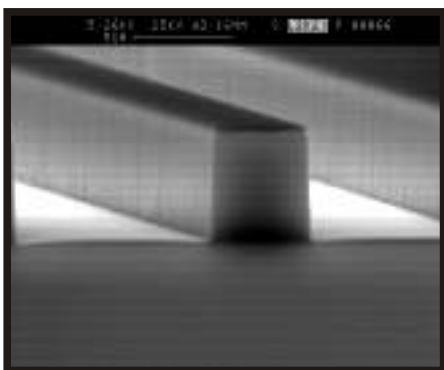
# Plasmalab Data

## InP/ InGaAsP Waveguide ICP Etching

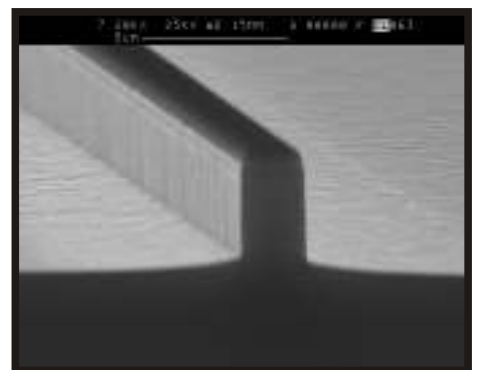


Top SEM's:  
Cl<sub>2</sub>, CH<sub>4</sub>, H<sub>2</sub>, Ar process  
10 µm deep InP/ InGaAsP etch  
process chemistry: Cl<sub>2</sub>, CH<sub>4</sub>, H<sub>2</sub>, Ar  
rate > 1.5 µ/ min  
selectivity > 15:1 to SiO<sub>2</sub> or SiN<sub>x</sub> mask  
uniformity < +/- 4 % (50 mm diameter)  
excellent profile control

**COMPARISON**  
The CH<sub>4</sub>/H<sub>2</sub>/Cl<sub>2</sub> process does not need wafer clamping or a heated electrode, so it simplifies the hardware and allows the use of wafer pieces or batches of full wafers on a carrier plate.  
The Cl<sub>2</sub>/N<sub>2</sub> process offers a cleaner alternative, but requires a heated electrode and wafer clamping, i.e. only suitable for full wafers (or small pieces glued to a carrier wafer). The HBr process in addition offers the possibility of resist masked high rate InP etching.



**Technology:**  
Reactive Ion Etching  
with ICP Source (13 MHz)  
Inductive Coupled Plasma  
RF driven substrate electrode  
*Plasmalab 80 Plus*  
*Plasmalab System 100*  
*Plasmalab System 133*



Cl<sub>2</sub>/ N<sub>2</sub> process  
5 µm deep etch in InP/ InGaAsP  
process chemistry: Cl<sub>2</sub>, N<sub>2</sub>  
rate > 1 µ/ min  
selectivity > 10:1 to SiO<sub>2</sub> or SiN<sub>x</sub> mask  
uniformity < +/- 4 % (50 mm diameter)  
excellent profile control

HBr process  
6 µm deep waveguide in InP/ InGaAsP  
process chemistry: HBr  
rate > 0.8 µ/ min  
selectivity > 10:1 to SiO<sub>2</sub> mask  
PR mask possible !  
uniformity < +/- 4 % (50 mm diameter)  
good profile control