IntelliSense Fabrication Platform

MEMS Fabrication Services

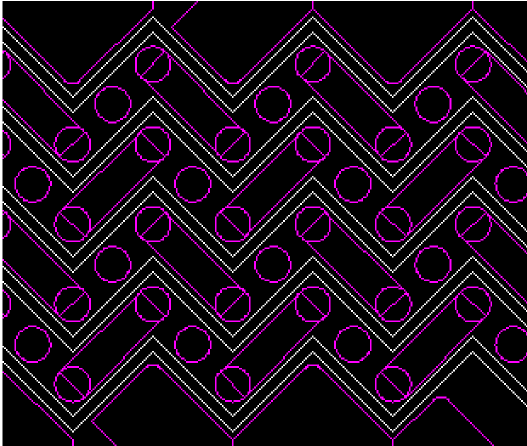
IntelliSense offers a total solution on the design and fabrication of MEMS devices. With the combination of IntelliSuite (professional MEMS design software) and our abundant experience on cleanroom work, we can serve in a better way to our customers. Below we present a summary of our process capabilities.

Process	Parameter	Wafer Size	Accuracy
Deposition process			
Sputter deposition	Material: Au, Pt, Al, Cu, Cr, Ti, Ni, NiCr, Al-Si-Cu, SiO2, Cr-Si-Ni, Tiw, etc.	4-6"	
Plasma-Enhanced Chemical Vapor Deposition (PECVD)	SiO2, Si3N4, SiC, A-Si, (Amorphous Silicon), Diamond-like, etc.	4-6"	
Thermal Oxidation		4-6"	
Annealing			
Etching process			
Standard cleaning	H2SO4, Ammonia water HCL(RCA1/RCA2)	4-6"	
Nonmetallic etching	SiO2, Si3N4, a-Si	4-6"	
Metallic etching	Al, Cu, Cr, Au, or Alloy	4-6"	
KOH anisotropic etching	Si	4-6"	
TMAH anisotropic etching	Si	4-6"	
Wet Etching for quartz	Quartz	4-6"	
Reactive Ion Etching（RIE）	Si, SiO2, Si3N4, Oxynitride , a-Si , SiC, Quartz, etc.	4-6"	
Plasma treatment	1. Background gas: Ar,N2, O2. 2. photoresist removal	4-6"	
CO2 Supercritical release	for the release of specific device structure	Sample size : diameter ≤150mm	

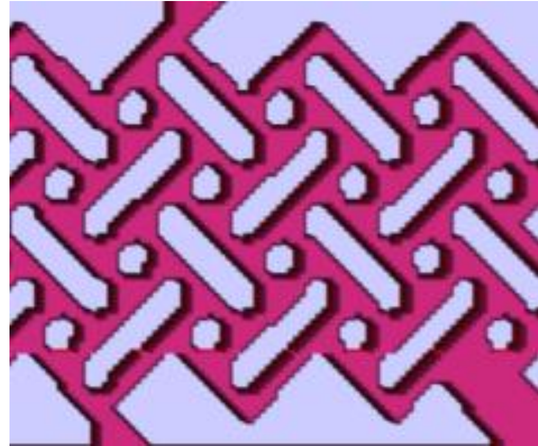
Lithography and bonding process			
Double-side lithography process	Si wafer, glass wafer	6"	Top alignment: 0.5um Bottom alignment: 1um
Wafer-level Bonding process	Silicon-silicon thermal bonding Glass-silicon anodic bonding Glass-glass thermal bonding Multi-stack bonding	6"	
Packaging and testing			
Test system for pressure sensor	Nonlinearity, sensitivity, repeatability, hysteresis loop, accuracy, temperature stability.		Standard: JB/T 10524-2005
Dicing	Suitable for: silicon wafer, glass wafer, Si-Glass bonded wafer, Glass-Glass bonded wafer	Sample size: diameter ≤200mm	
3D Scanning Microscope	A laser system with the ability on the test of 3D surface topography and roughness.		
Profilometer			
Semiconductor parameter measurement			
Film thickness measurement			
Sheet resistance measurement			
Semiconductor logical analysis			
Others			
CNC Engraving processing	Drilling holes on glass wafer Thread cutting Engraving and stamping		0.1mm

Application case

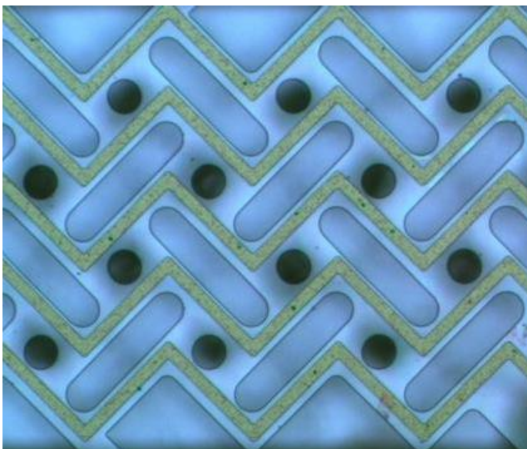
1. Fabrication of the Nickel-sensitive chip for gas flow sensor



1. mask design



2. model analysis



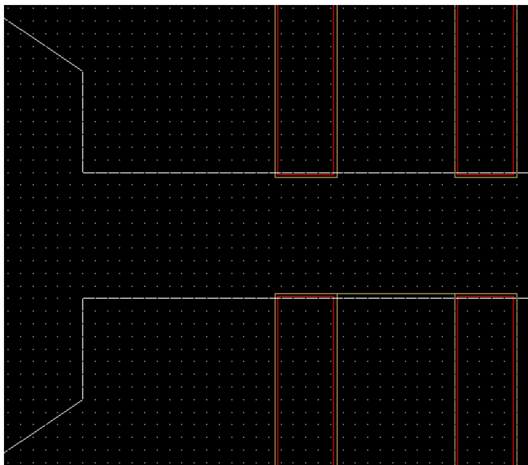
3. chip fabrication

4. packaging and testing

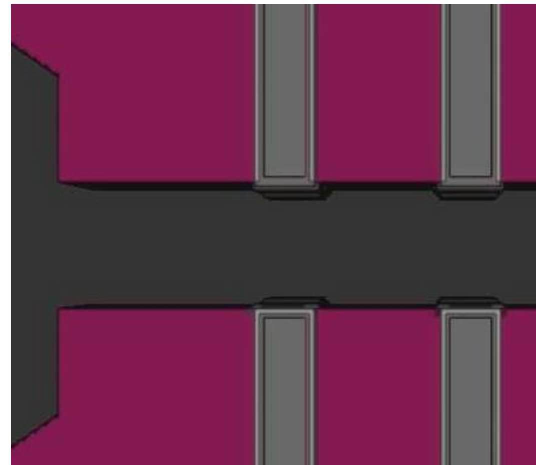
Key features：

- Stress-controllable film deposition
- Reticular silicon oxynitride membrane with the thickness less than 1um (the minimum thickness can reach to 750nm)
- TCR: higher than 5000ppm/K
- Modification of the nickel material when deposited
- Wet etching for the tiny structure

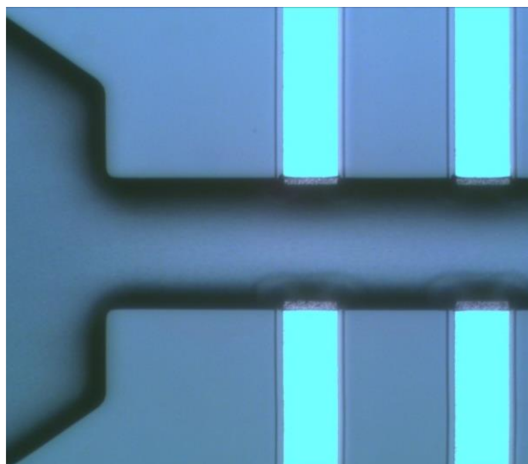
2. Fabrication of Microfluidic chips with various material and processes



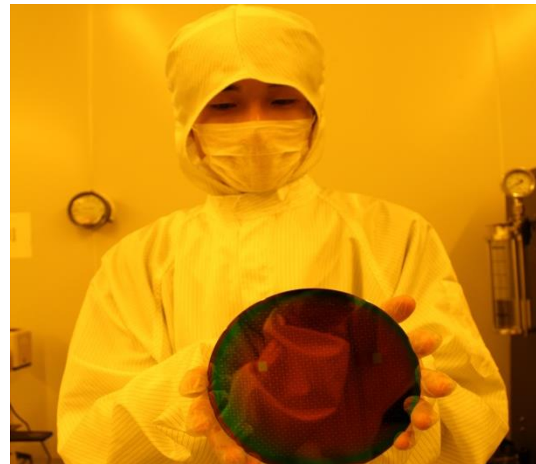
1.Mask Design



2.Model Analysis



3.Chip Fabrication



4.Test and Measurement

Key features：

- Micro-channels on silicon, glass and PDMS
- A variety of metal materials for electrodes (Etching/Lift off)
- Bonding process with multiple wafers (can be silicon and glass)
- Manufacture of SU8 or silicon mold
- PDMS-Glass bonding
- Drilling holes on glass wafer, anodic bonding with dielectric layer