

CLAIMS

1. An apparatus, comprising:
 - (a) a circuit and at least one sensor on a die attached to the circuit, the circuit comprising an electrical interconnect for external electrical connection; and
 - (b) a laminated manifold attached to the circuit to deliver a liquid reagent over an active surface of the at least one sensor, the laminated manifold comprising at least one fluidic channel, wherein an interface between the die and the at least one fluidic channel is sealed,
 - (i) wherein the laminated manifold comprises a plurality of layers, the plurality of layers comprising:
 - a top lidding layer;
 - a fluidic distribution layer;
 - a substrate layer; and
 - a bottom planarization layer;
 - (ii) wherein the laminated manifold has at least one cut-out for the die; and
 - (iii) wherein the circuit is bonded to the bottom planarization layer.
2. The apparatus of claim 1, wherein the at least one sensor comprises a semiconductor.
3. The apparatus of claim 1 or 2, wherein the at least one sensor comprises a Complementary Metal-Oxide Semiconductor (CMOS) sensor.
4. The apparatus of any one of the preceding claims, wherein the bottom planarization layer has a thickness that is about a collective thickness of the at least one sensor and die.
5. The apparatus of any one of the preceding claims, wherein between adjacent layers of the plurality of layers is a pressure-sensitive adhesive.
6. The apparatus of any one of claims 1-4, wherein adjacent layers of the plurality of layers are mechanically connected.
7. The apparatus of any one of the preceding claims, wherein the apparatus is part of a cartridge for biological analysis.

8. The apparatus of any one of claims 1-6, wherein the apparatus is part of a cartridge for chemical analysis.
9. The apparatus of any one of claim 1-6 , wherein the apparatus is part of a cartridge, and wherein the cartridge further comprises:
 - a reagent storage and delivery system coupled to the laminated manifold; and
 - a cartridge body and a reagent pump coupled to the reagent storage and delivery system.
10. The apparatus of any one of the preceding claims, wherein the die is wire bonded to the circuit.
11. The apparatus of any one of the preceding claims, wherein when in use, a reagent is delivered via the laminated manifold over an active surface of the at least one sensor.
12. The apparatus of claim 11, wherein only the active surface of the at least one sensor is exposed to the reagent.
13. A method,
 - (a) wherein the method comprises:
 - (i) assembling a laminated manifold, the laminated manifold comprising at least one fluidic channel, wherein assembling the laminated manifold comprises laminating a plurality of layers, the plurality of layers comprising:
 - (1) a top lidding layer;
 - (2) a fluidic distribution layer;
 - (3) a substrate layer; and
 - (4) a bottom planarization layer;
 - (ii) attaching at least one sensor on a die to a circuit, the circuit comprising an electrical interconnect;
 - (iii) bonding the bottom planarization layer to the circuit, the bottom planarization layer comprising a cut-out for the die;
 - (iv) placing sealing adhesive at sides of the die;
 - (v) attaching the laminated manifold to the circuit; and
 - (vi) sealing an interface between the die and the at least one fluidic channel; and
 - (b) wherein the laminated manifold and bonded circuit together comprise an assembly.
14. The method of claim 13, further comprising attaching the assembly to a cartridge.

15. The method of claim 13 or 14, wherein the laminating comprises using a pressure-sensitive adhesive between adjacent layers of the plurality of layers.
16. The method of any one of claims 13-15, further comprising using the assembly for sequencing.
17. The method of any one of claims 13-15, further comprising using the assembly for genotyping.
18. The method of any one of claims 13-17, wherein the bottom planarization layer has a thickness that is about a collective thickness of the at least one sensor and die.