Fabrication of Electronic and Photonic Systems on Flexible Substrate by Layer Transfer Method
Technology #10862

Applications

Applications for this technology are found in electronic and photonic devices, nanopatterning for biological and chemical applications, and industrial printing.

Problem Addressed

Flexible substrates are light weight and highly resistant to impact damage. In addition, their bendability and foldability make them excellent for extension to very large area substrates. Currently, there is a general interest in using flexible substrates for all types of active and passive electronic and photonic devices, including transistor logic elements, memory devices, radio frequency and microwave devices, micro-photonics devices, optoelectronic sensors and actuators for MEMS applications, and micropower sources for self-powered systems. One of the critical barriers for realizing flexible systems is that flexible substrates often have low melting temperatures. Current fabrication techniques often have high process temperatures, which are unsuitable for flexible substrates.

Technology

The invention is a method for using a transfer layer material to resolve the low melting point temperature problem involved in fabricating flexible substrates. Electronic and photonic devices are initially fabricated on a transparent transfer material, which is chosen so that the devices can easily be separated from it. Then the devices are removed from the transfer layers and are transferred to the flexible substrate. The invention includes a detailed method for choosing and growing the transfer layer, methods for removing the layer after device fabrication and optimal methods for transfer of the devices to the flexible substrate.

Advantages

- Consistent
- Reliable
- Flexible
- Inexpensive

Categories For This Invention:

- Electronics & Circuits
- Electronic Components
- Materials
- Thin Films
Photonics
Other (Photonics)
Life Sciences
Chemicals
Other (Chemicals)
Research Tools
Micro/nanoparticles (Research Tools)

**Intellectual Property:**

Fabrication of electronic and photonic systems on flexible substrates by layer transfer method
Issued US Patent
8,232,182

Fabrication of electronic and photonic systems on flexible substrates by layer transfer method
Issued US Patent
9,012,992

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**External Links:**

Crystal Physics & Electroceramics Laboratory
http://electroceramics.mit.edu/index.php

Microsystems Technology Laboratories
http://www-mtl.mit.edu/~akinwand/contact.html

**Image Gallery:**

![Image of micro/nanoparticles](image_url)

**Figure 1**