What is claimed is:

1. An optoelectronic module comprising:

an optoelectronic device mounted on a substrate;

sidewalls of the module laterally surrounding the optoelectronic device and in direct contact with sides of the optoelectronic device, wherein the sidewalls are composed of a material that is non-transparent to light emitted by or detectable by the optoelectronic device; ~~and~~

a transparent device cover disposed ~~over~~ on the optoelectronic device; and

a module cover disposed over the transparent device cover, and including an optical element on a surface of a transparent section of the module cover, wherein

the sidewalls of the module serve as a spacer that contacts a surface of the substrate on which the optoelectronic device is mounted and that also contacts an opposing surface of the module cover.

2. The optoelectronic module of claim 1 wherein the sidewalls are composed of a vacuum injected material.

3. The optoelectronic module of any one of the previous claims wherein the sidewalls are composed of a UV or thermally-cured polymer material containing a non-transparent filler material.

4. The optoelectronic module of any one of claims 1 - 3 wherein ~~the transparent cover is separated from the substrate by the sidewalls, the module further including~~ the optical element is a passive optical element disposed on ~~a~~ the transparent section of the ~~transparent~~ module cover ~~for the module~~.

5. The optoelectronic module of any one of claims 1 – 3 wherein the optoelectronic device includes:

a light emitting element or a light detecting element~~; and~~

~~a transparent device cover over the light emitting element or the light detecting element, wherein the transparent device cover is different from the transparent cover disposed over the optoelectronic device~~.

~~6. The optoelectronic module of claim 5 including a passive optical element disposed directly on the transparent device cover.~~

~~7~~6. The optoelectronic module of ~~any one of claims 5 - 6~~ claim 1 wherein the non-transparent material of the sidewalls is overmolded on the transparent device cover near its edges.

~~8. The optoelectronic module of any one of claims 1 - 3 wherein the transparent cover is a passive optical element.~~

~~9~~7. The optoelectronic module of ~~any one of claims 6 - 8~~ claim 4 wherein the passive optical element is a lens.

~~10~~8. The optoelectronic module of ~~any one of claims 6 - 9~~ claim 4 further including a baffle laterally surrounding the passive optical element, wherein the baffle is composed of the same non-transparent material as the sidewalls of the module.

~~11~~9. The optoelectronic module of any one of the previous claims further including an adhesive underfill between the optoelectronic device and the substrate on which it is mounted.

~~12~~10. A wafer-level method of fabricating optoelectronic modules, the method comprising:

providing a support wafer on which are mounted a plurality of optoelectronic devices, a respective transparent device cover disposed on each optoelectronic device;

using a vacuum injection technique to provide a non-transparent material on sides of each of the optoelectronic devices;

attaching a cover wafer over the optoelectronic devices so as to form a wafer stack, wherein the cover wafer provides a transparent section over each of the optoelectronic devices and includes an optical element on a surface of each of the transparent sections of the cover wafer; and

separating the wafer stack into a plurality of individual optoelectronic modules each of which includes one of the optoelectronic devices laterally surrounded by sidewalls of the module, the sidewalls being in direct contact with the sides of the optoelectronic device and being composed of the vacuum injected material, wherein the sidewalls serve as a spacer that contacts a surface of the support wafer on which the optoelectronic devices are mounted and that also contacts an opposing surface of a section of the cover wafer that forms a module cover.

~~13~~11. The method of claim ~~12~~10 wherein the vacuum injected material is substantially non-transparent to light emitted by or detectable by the optoelectronic devices.

~~14~~12. The method of any one of claims ~~12~~10 or ~~13~~11 wherein the sidewalls are composed of a UV or thermally-cured polymer material containing a non-transparent filler material.

~~15~~13. The method of any one of claims ~~12~~10 - ~~14~~12 wherein the cover wafer includes a plurality of passive optical elements such that a respective one of the passive optical elements is disposed over each optoelectronic device.

~~16~~14. The method of claim ~~15~~13 wherein the passive optical elements are replicated directly on a surface of the cover wafer.

~~17~~15. The method of any one of claims ~~12~~10 – ~~16~~14 including attaching the cover wafer to the non-transparent material that forms the sidewalls for the modules.

~~18~~16. The method of any one of claims ~~12~~10 – ~~17~~15 wherein using a vacuum injection technique to provide a non-transparent material on sides of each of the optoelectronic devices includes:

causing a non-transparent material composed of a flowable polymer material containing a non-transparent filler to be provided in spaces of a vacuum injection tool, wherein the spaces laterally surround the sides of the optoelectronic devices; and

causing the non-transparent material to harden.

~~19. A wafer-level method of fabricating optoelectronic modules, the method comprising:~~

~~providing a support wafer on which are mounted a plurality of optoelectronic devices;~~

~~using a vacuum injection technique to provide a non-transparent material on sides of each of the optoelectronic devices;~~

~~forming a respective passive optical element on a surface of each of the optoelectronic devices; and~~

~~separating the support wafer to form a plurality of individual optoelectronic modules each of which includes one of the optoelectronic devices laterally surrounded by sidewalls, the sidewalls being in direct contact with the sides of the optoelectronic device and being composed of the vacuum injected material.~~

~~20. The method of claim 19 wherein the sidewalls are composed of a material that is substantially non-transparent to light emitted by or detectable by the optoelectronic devices.~~

~~21. The method of any one of claims 19 or 20 including replicating the passive optical elements on the surface of each of the optoelectronic devices.~~

~~22. The method of claim 21 including using a combined vacuum injection and replication tool to provide the vacuum injected material for the sidewalls and to form the replicated passive optical elements.~~

~~23. The method of claim of any of claims 19-22 including overmolding the non-transparent material on an upper surface of each of the optoelectronic devices near its edges.~~

~~24. The method of claim 23 wherein the overmolded non-transparent material on the upper surface of each optoelectronic device defines a respective cavity for a location of a respective one of the passive optical elements.~~

~~25. An optoelectronic module comprising:~~

~~an optoelectronic device;~~

~~sidewalls laterally surrounding the optoelectronic device and in direct contact with sides of the optoelectronic device, wherein the sidewalls are composed of a material that is non-transparent to light emitted by or detectable by the optoelectronic device;~~

~~a passive optical element disposed on an upper surface of the optoelectronic device; and~~

~~electrically conductive contacts on an underside of the optoelectronic device and arranged to mount the module directly on a printed circuit board of a host device.~~

~~26. The optoelectronic module of claim 25 wherein the at least a portion of the sidewalls serves as an outer wall of the module.~~

~~27. The optoelectronic module of any one of claims 25 - 26 wherein the sidewalls are composed of a vacuum injected material.~~

~~28. The optoelectronic module of any one of claims 25 - 27 wherein the sidewalls are composed of a UV or thermally-cured polymer material containing a non-transparent filler material.~~

~~29. The optoelectronic module of claim 25 wherein the passive optical element is a lens.~~

~~30. The optoelectronic module of claim 25 further including a baffle laterally surrounding the passive optical element, wherein the baffle is composed of the same non-transparent material as the sidewalls.~~

~~31. A wafer-level method of fabricating optoelectronic modules, the method comprising:~~

~~providing a sacrificial support on which are mounted a plurality of optoelectronic devices;~~

~~using a replication technique to form a respective passive optical element on a surface of each of the optoelectronic devices;~~

~~using a vacuum injection technique to provide sidewalls on sides of each of the optoelectronic devices; and~~

~~separating or removing the sacrificial support from the optoelectronic device.~~

~~32. The method of claim 31 wherein the sacrificial support is composed of a soft adhesive material.~~

~~33. The method of claim 32 wherein the soft adhesive material comprises a PDMS or polymer foam.~~

~~34. The method of any one of claims 31—33 wherein separating or removing the sacrificial support includes lifting the optoelectronic devices off the sacrificial support.~~

~~35. The method of claim 31 wherein the sacrificial support is composed of a film photoresist or a dry resist.~~

~~36. The method of any one of claims 31 or 35 wherein separating or removing the sacrificial support includes applying UV radiation to the sacrificial support.~~

~~37. The method of any one of claims 31—36 further including hardening the sidewalls using UV or thermal curing.~~

~~38. The method of claim 37 wherein the sidewalls are substantially non-transparent to light emitted by or detectable by the optoelectronic devices.~~

~~39. The method of any one of claims 31 – 38 wherein each passive optical element is a lens.~~

~~40. The method of any one of claims 31 – 39 including using a combined vacuum injection and replication tool to form the passive optical elements and to provide vacuum injected material for the sidewalls.~~

~~41. The method of any one of claims 31 – 40 further including separating into individual modules.~~

~~42. A wafer-level method of fabricating optoelectronic modules, the method comprising:~~

~~providing a support substrate on which are mounted a plurality of optoelectronic devices;~~

~~performing a first vacuum injection technique to surround each optoelectronic device laterally with a transparent overmold region, wherein the overmold region also covers a top surface of the optoelectronic device;~~

~~performing a replication technique to form a respective passive optical element on a top surface of each overmold region; and~~

~~peforming a second vacuum injected technique to form sidewalls laterally surrounding and in contact with sides of each overmold region.~~

~~43. The method of claim 42 including:~~

~~using a first vacuum injection tool to perform the first vacuum injection technique; and~~

~~using a second combined replication and vacuum injection tool to perform the replication technique and the second vacuum injection technique.~~

~~44. The method of any one of claims 42 or 43 wherein the sidewalls are composed of a material that is substantially non-transparent to light emitted by or detectable by the optoelectronic devices.~~

~~45. The method of any one of claims 42 – 44 further including hardening vacuum injected material for the overmold regions by UV or thermal curing.~~

~~46. The method of any one of claims 42 – 45 further including hardening vacuum injected material for the sidewalls by UV or thermal curing.~~

~~47. The method of any one of claims 42 – 46 further including separating into individual modules.~~

~~48. An optoelectronic module comprising:~~

~~an optoelectronic device mounted on a substrate;~~

~~a transparent overmold laterally surrounding sides of the optoelectronic device and covering a top surface of the optoelectronic device, wherein the overmold is in direct contact with the optoelectronic device;~~

~~a passive optical element on a top surface of the overmold;~~

~~sidewalls laterally surrounding the optoelectronic device and in direct contact with sides of the overmold.~~

~~49. The optoelectronic module of claim 48 wherein the sidewalls are composed of a material that is substantially non-transparent to light emitted by or detectable by the optoelectronic device.~~

~~50. The optoelectronic module of any one of claims 48 or 49 wherein the passive optical element is a lens.~~

~~51. The optoelectronic module of any one of claims 48 – 50 wherein the top surface of the overmold has a curved shape that corresponds to a shape of a surface of the passive optical element.~~

~~52. The optoelectronic module of any one of claims 48 – 50 wherein the top surface of the overmold is slanted with respect to a plane of the substrate on which the optoelectronic device is mounted.~~

~~53. The optoelectronic module of any one of claims 48 – 52 wherein the at least a portion of the sidewalls serves as an outer wall of the module.~~

~~54. The optoelectronic module of any one of claims 48 – 53 the passive optical element is composed of a material having a higher index of refraction than that of the overmold.~~

~~55. The optoelectronic module of any one of claims 48 – 54 wherein the overmold is composed of a curable polymer.~~

~~56. A wafer-level method of fabricating optoelectronic modules, the method comprising:~~

~~providing a support substrate on which are mounted a plurality of optoelectronic devices;~~

~~performing a screen print technique to surround each optoelectronic device laterally with a transparent overmold region, wherein the overmold region also covers a top surface of the optoelectronic device;~~

~~performing a replication technique to form a respective passive optical element on a top surface of each overmold region; and~~

~~peforming a vacuum injected technique to form sidewalls laterally surrounding and in contact with sides of each overmold region.~~

~~57. A wafer-level method of fabricating optoelectronic modules, the method comprising:~~

~~providing a support substrate on which are mounted a plurality of optoelectronic devices;~~

~~performing a first vacuum injection to surround each optoelectronic device laterally with a transparent overmold, wherein each overmold further covers an upper surface of a respective one of the optoelectronic devices, the overmold having a curved upper surface disposed above the upper surface of the respective one of the optoelectronic devices; and~~

~~performing a second vacuum injection to form sidewalls laterally surrounding and in contact with sides of each overmold region, the sidewalls being composed of a material that is substantially non-transparent to light emitted by or detectable by the optoelectronic devices.~~

~~58. The method of claim 57 including removing, prior to performing the second vacuum injection, portions of overmold material applied during the first vacuum injection to form spaces in which the non-transparent material for the sidewalls is subsequently injected.~~

~~59. The method of claim 58 wherein removing portions of overmold material includes using a dicing technique.~~

~~60. The method of claim 57 wherein each optoelectronic module includes a respective lens disposed over each of the optoelectronic devices.~~

~~61. The method of claim 57 wherein the transparent overmolds are composed of an epoxy material.~~

~~62. The method of claim 57 wherein the non-transparent material of the sidewalls is composed of an epoxy material.~~

~~63. The method of claim 57 further including:~~

~~curing the overmolds after performing the first vacuum injection; and~~

~~curing the material of the sidewalls after performing the second vacuum injection.~~

~~64. The method of claim 63 including hardening the overmolds by UV or thermal curing.~~

~~65. The method of claim 63 including hardening the material for the sidewalls by UV or thermal curing.~~

~~66. The method of claim 57 further including separating into individual optoelectronic modules, each of which includes at least one of the optoelectronic devices laterally surrounded by a transparent overmold whose sides are laterally surrounded by, and in contact with, substantially non-transparent sidewalls.~~

~~67. The method of claim 66 including separating into individual optoelectronic modules, each of which includes a plurality of the optoelectronic devices.~~