WHAT IS CLAIMED IS:

1. An optical device, comprising:

a first waveguide slab located over a planar optical substrate and having a first plane of symmetry;

first and second input port couplers extending from said first waveguide slab and having a first input coupler pair axis located about midway between said first and second input port couplers and offset at a nonzero first distance from said first plane of symmetry; and

first and second output port couplers extending from said first waveguide slab and having a first output coupler pair axis located about midway between said first and second output port couplers and offset at a nonzero second distance from said first plane of symmetry, wherein the nonzero second distance is different from the nonzero first distance

wherein said first waveguide slab, said input port couplers and said output port couplers are formed in a single mode passive waveguide stack, and further comprising a dilute waveguide stack located between said optical substrate and said waveguide slab.

2. The optical device of Claim 1, further comprising:

third and fourth input port couplers extending from said first waveguide slab and having a second input coupler pair axis located about midway between said third and fourth input couplers and offset at said first distance from said first plane of symmetry such that said first plane of symmetry is about midway between said first and second input coupler pair axes; and

third and fourth output port couplers extending from said first waveguide slab and having a second output coupler pair axis located about midway between said third and fourth output port couplers and offset at said second distance from said first plane of symmetry such that said first plane of symmetry is about midway between said first and second output coupler pair axes.

3. The optical device of Claim 1, wherein said input port couplers and said output port couplers each include a tapered waveguide section.

4. The optical device of claim 1, wherein said first and second input port couplers are a first pair of adjacent input couplers, and, further including:

a second pair of adjacent third and fourth input port couplers extending from said first waveguide slab and having a second input coupler pair axis located about midway between said adjacent pairs third and fourth input couplers and offset at said nonzero first distance from said first plane of symmetry such that said first plane of symmetry is about midway between said first and second input coupler pair axes, wherein:

said second pair of third and fourth input port couplers are adjacent to said first pair of first and second input port couplers, and

a separation distance between said third input port coupler and said second input port coupler is greater than a separation distance between said first and second input port couplers.

5. An optical device, comprising:

a first waveguide slab located over a planar optical substrate and having a first plane of symmetry;

first and second input port couplers extending from said first waveguide slab and having a first input coupler pair axis located about midway between said first and second input port couplers and offset at a nonzero first distance from said first plane of symmetry; and

first and second output port couplers extending from said first waveguide slab and having a first output coupler pair axis located about midway between said first and second output port couplers and offset at a nonzero second distance from said first plane of symmetry, wherein the nonzero second distance is different from the nonzero first distance, further comprising:

a second waveguide slab located over said planar optical substrate and having a second plane of symmetry;

third and fourth input port couplers extending from said second waveguide slab and having a second input coupler pair axis located about midway between said third and fourth input couplers; and

an optical splitter formed over said optical substrate and having a first splitter output connected to one of said first and second input couplers and a second splitter output connected to one of said third and fourth input couplers.

6. The optical device of Claim 5, further comprising:

fifth and sixth input port couplers extending from said first waveguide slab;

seventh and eighth input port couplers extending from said second waveguide slab; and

a polarization beam splitter configured to:

separate first and second polarizations of a modulated optical signal; and

couple said first polarization to one of said fifth and sixth input optical couplers, and couple said second polarization to one of said seventh and eighth input optical couplers.

7. The optical device of Claim 6, wherein said optical splitter is formed in a single mode passive waveguide stack located over a dilute waveguide stack, and said optical splitter is configured to receive a local oscillator signal via a mode coupler formed in said dilute waveguide stack.

8. A method, comprising:

forming a first waveguide slab located over a planar optical substrate and having a first plane of symmetry;

forming first and second input port couplers extending from said first waveguide slab and having a first input coupler pair axis located about midway between said first and second input port couplers and offset at a nonzero first distance from said first plane of symmetry; and

forming first and second output port couplers extending from said first waveguide slab and having a first output coupler pair axis located about midway between said first and second output port couplers and offset at a nonzero second distance from said first plane of symmetry wherein the nonzero second distance is different from the nonzero first distance, wherein said first waveguide slab, said input port couplers and said output port couplers are formed in a single mode passive waveguide stack located over a dilute waveguide stack located between said optical substrate and said waveguide slab.

9. The method of Claim 8, further comprising:

forming third and fourth input port couplers extending from said first waveguide slab and having a second input coupler pair axis located about midway between said third and fourth input couplers and offset at said first distance from said first plane of symmetry such that said first plane of symmetry is about midway between said first and second input coupler pair axes; and

forming third and fourth output port couplers extending from said first waveguide slab and having a second output coupler pair axis located about midway between said third and fourth output port couplers and offset at said second distance from said first plane of symmetry such that said first plane of symmetry is about midway between said first and second output coupler pair axes.

10. The method of Claim 8, further comprising:

forming a second waveguide slab located over said planar optical substrate and having a second plane of symmetry;

forming third and fourth input port couplers extending from said second waveguide slab and having a second input coupler pair axis located about midway between said third and fourth input couplers;

forming an optical splitter over said optical substrate;

connecting a first splitter output to one of said first and second input couplers; and

connecting a second splitter output to one of said third and fourth input couplers

CLAIMS:

1. An optical device, comprising:

a first waveguide slab located over a planar optical substrate and having a first plane of symmetry;

first and second input port couplers extending from said first waveguide slab and having a first input coupler pair axis located about midway between said first and second input port couplers and offset at a nonzero first distance from said first plane of symmetry; and

first and second output port couplers extending from said first waveguide slab and having a first output coupler pair axis located about midway between said first and second output port couplers and offset at a nonzero second distance from said first plane of symmetry, wherein the nonzero second distance is different from the nonzero first distance

wherein said first waveguide slab, said input port couplers and said output port couplers are formed in a single mode passive waveguide stack, and further comprising a dilute waveguide stack located between said optical substrate and said waveguide slab.

2. The optical device of Claim 1, further comprising:

third and fourth input port couplers extending from said first waveguide slab and having a second input coupler pair axis located about midway between said third and fourth input couplers and offset at said first distance from said first plane of symmetry such that said first plane of symmetry is about midway between said first and second input coupler pair axes; and third and fourth output port couplers extending from said first waveguide slab and having a second output coupler pair axis located about midway between said third and fourth output port couplers and offset at said second distance from said first plane of symmetry such that said first

plane of symmetry is about midway between said first and second output coupler pair axes.

3. The optical device of Claim 1, wherein said input port couplers and said output port couplers each include a tapered waveguide section.

4. The optical device of Claim 3, wherein said tapered waveguide sections have a parabolic taper profile.

5. The optical device of Claim 1, wherein only one of said input port couplers is configured to receive an optical signal.

6. The optical device of Claim 1, wherein one of said first and second input port couplers is connected to a first mode converter formed in said dilute waveguide stack, and one of said third and fourth input port couplers is connected to an optical splitter located over said substrate.

7. An optical device, comprising:

a first waveguide slab located over a planar optical substrate and having a first plane of symmetry;

first and second input port couplers extending from said first waveguide slab and having a first input coupler pair axis located about midway between said first and second input port couplers and offset at a nonzero first distance from said first plane of symmetry; and

first and second output port couplers extending from said first waveguide slab and having a first output coupler pair axis located about midway between said first and second output port couplers and offset at a nonzero second distance from said first plane of symmetry,

wherein the nonzero second distance is different from the nonzero first distance, further comprising:

a second waveguide slab located over said planar optical substrate and having a second plane of symmetry;

third and fourth input port couplers extending from said second waveguide slab and having a second input coupler pair axis located about midway between said third and fourth input couplers; and

an optical splitter formed over said optical substrate and having a first splitter output connected to one of said first and second input couplers and a second splitter output connected to one of said third and fourth input couplers.

8. The optical device of Claim 7, further comprising:

fifth and sixth input port couplers extending from said first waveguide slab;

seventh and eighth input port couplers extending from said second waveguide slab; and

a polarization beam splitter configured to:

separate first and second polarizations of a modulated optical signal; and

couple said first polarization to one of said fifth and sixth input optical couplers, and couple said second polarization to one of said seventh and eighth input optical couplers.

9. The optical device of Claim 7, wherein said optical splitter is formed in a single mode passive waveguide stack located over a dilute waveguide stack, and said optical splitter is configured to receive a local oscillator signal via a mode coupler formed in said dilute

waveguide stack.

10. The optical device of Claim 8, wherein said optical splitter and said input port couplers are connected by waveguides having a root mean square width variation no greater than about 100 nm.

11. The optical device of Claim 6, wherein said first waveguide slab, said input couplers and said output couplers are configured to separate in-phase and quadrature channels of a received phase-shift-keyed optical signal received via said first mode converter, wherein said optical signal at any one wavelength in a range of about 1530 nm to about 1570 nm has a phase variation of no greater than about $\pm 5°$.

12. A method, comprising:

forming a first waveguide slab located over a planar optical substrate and having a first plane of symmetry;

forming first and second input port couplers extending from said first waveguide slab and having a first input coupler pair axis located about midway between said first and second input port couplers and offset at a nonzero first distance from said first plane of symmetry; and

forming first and second output port couplers extending from said first waveguide slab and having a first output coupler pair axis located about midway between said first and second output port couplers and offset at a nonzero second distance from said first plane of symmetry wherein the nonzero second distance is different from the nonzero first distance, wherein said first waveguide slab, said input port couplers and said output port couplers are formed in a single mode passive waveguide stack located over a dilute waveguide stack located between

said optical substrate and said waveguide slab.

13. The method of Claim 12, further comprising:

forming third and fourth input port couplers extending from said first waveguide slab and having a second input coupler pair axis located about midway between said third and fourth input couplers and offset at said first distance from said first plane of symmetry such that said first plane of symmetry is about midway between said first and second input coupler pair axes; and

forming third and fourth output port couplers extending from said first waveguide slab and having a second output coupler pair axis located about midway between said third and fourth output port couplers and offset at said second distance from said first plane of symmetry such that said first plane of symmetry is about midway between said first and second output coupler pair axes.

14. The method of Claim 12, wherein said input port couplers and said output port couplers each include a tapered waveguide section.

15. The method of Claim 14, wherein said tapered waveguide sections have a parabolic taper profile.

16. The method of Claim 12, wherein only one of said input port couplers is configured to receive an optical signal.

17. The method of Claim 13, wherein one of said first and second input port couplers is connected to a first mode converter formed in said dilute waveguide stack, and one of said third and fourth input port couplers is connected to an optical splitter located over said substrate.

18. The method of Claim 12, further comprising:

forming a second waveguide slab located over said planar optical substrate and having a second plane of symmetry;

forming third and fourth input port couplers extending from said second waveguide slab and having a second input coupler pair axis located about midway between said third and fourth input couplers;

forming an optical splitter over said optical substrate;

connecting a first splitter output to one of said first and second input couplers; and

connecting a second splitter output to one of said third and fourth input couplers.

19. The method of Claim 18, further comprising:

forming fifth and sixth input port couplers extending from said first waveguide slab;

forming seventh and eighth input port couplers extending from said second waveguide slab;

configuring a polarization beam splitter to separate first and second polarizations of a modulated optical signal;

couple said first polarization to one of said fifth and sixth input optical couplers; and

couple said second polarization to one of said seventh and eighth input optical couplers.

20. The method of Claim 19, wherein said optical splitter is formed in a single mode passive waveguide stack located over a dilute waveguide stack, and further comprising configuring a local oscillator to provide a local oscillator signal to said optical splitter via a mode coupler formed in said dilute waveguide stack.

21. (Original) The method of Claim 18, wherein said optical splitter and said input port couplers are connected by waveguides having a root mean square width variation no greater than about 100 nm.

22. The method of Claim 17, wherein said first waveguide slab, said input couplers and said output couplers are configured to separate in-phase and quadrature channels of a received phase-shift-keyed optical signal received via said first mode converter, wherein said optical signal at any one wavelength in a range of about 1530 nm to about 1570 nm has a phase variation of no greater than about $\pm 5°$.

23. The optical device of claim 1, wherein said first and second input port couplers are a first pair of adjacent input couplers, and, further including:

a second pair of adjacent third and fourth input port couplers extending from said first waveguide slab and having a second input coupler pair axis located about midway between said adjacent pairs third and fourth input couplers and offset at said nonzero first distance from said first plane of symmetry such that said first plane of symmetry is about midway between said first and second input coupler pair axes, wherein:

said second pair of third and fourth input port couplers are adjacent to said first

pair of first and second input port couplers, and

a separation distance between said third input port coupler and said second input port coupler is greater than a separation distance between said first and second input port couplers.