## CLAIMS

What is claimed is:

1. An optical module, comprising a housing, a circuit board assembly, an optical assembly, and an optical receptacle; the housing includes a first housing, a second housing and an optical fiber adapter, and the first housing is covered with the second housing to form an internal accommodating cavity; the circuit board assembly and the optical assembly are disposed in the internal accommodating cavity; the circuit board assembly includes a rigid circuit board; wherein,

the housing is provided with an electrical interface and an optical interface, and the circuit board assembly is fixed on the first housing and adjacent to one end with the electrical interface;

the optical assembly is fixed to the first housing, the optical assembly includes an optical processing assembly and photoelectric chips, and the optical processing assembly includes a wavelength division multiplexer, a lens group located between the wavelength division multiplexer and the photoelectric chips, and a lens group between the wavelength division multiplexer and the optical receptacle, respectively; the optical processing assembly is used for optical transmission between the photoelectric chips and the optical receptacle, and the photoelectric chips are adjacent to the rigid circuit board and electrically connected to the rigid circuit board;

the optical fiber adapter is disposed at the optical interface of the housing, the optical fiber adapter is integrally molded with the optical interface, and one end of the optical receptacle extends into the optical fiber adapter; wherein the optical fiber adapter, the optical receptacle, the optical

assembly, and the rigid circuit board have hard connections therebetween,

wherein the optical processing assembly includes a transmitting-end optical processing assembly and a receiving-end optical processing assembly, and the transmitting-end optical processing assembly includes the wavelength division multiplexer and a first periscope; the receiving-end optical processing assembly includes a wavelength division demultiplexer and a second periscope, and

wherein the optical receptacle includes a transmitting-end optical receptacle and a receiving-end optical receptacle;

the photoelectric chips include laser chips and photodetector chips;

the laser chips, the wavelength division multiplexer and the receiving-end optical receptacle are located on a same side within the first housing, and the photodetector chips, the wavelength division demultiplexer and the transmitting-end optical receptacle are located on another side within the first housing;

the first periscope and the second periscope overlap with each other, the first periscope guides optical signals that are output from the wavelength division multiplexer to the side with the transmitting-end optical receptacle, and the second periscope guides optical signals that are received by the receiving-end optical receptacle into the wavelength division demultiplexer.

2. The optical module according to claim 1,

wherein the optical fiber adapter is partially integrally molded with the first housing and partially integrally molded with the second housing, and

the first housing and the second housing are matched together to form the optical fiber adapter at the optical interface; or, the optical fiber adapter is integrally molded with the first housing.

3. The optical module according to claim 1,

wherein the circuit board assembly is fixed within the first housing by glue, fasteners, and/or snaps.

4. The optical module according to claim 1, wherein,

the photoelectric chips include laser chips;

the laser chips are disposed on a substrate, and the laser chips are electrically connected to the substrate;

the substrate is electrically connected to the rigid circuit board by bonding wires or transfer boards, or, the rigid circuit board is electrically connected to the substrate by lap-jointing.

5. The optical module according to claim 1, wherein the optical module further comprising transimpedance amplifiers, and the photoelectric chips include photodetector chips, the photodetector chips are electrically connected to the transimpedance amplifiers via bonding wires, and the transimpedance amplifiers are electrically connected to the rigid circuit board via bonding wires.

6. The optical module according to claim 1,

wherein the first housing includes a bottom plate, and the optical

processing assembly is directly fixed to the bottom plate through an adhesive layer.

7. The optical module according to claim 1,

wherein the optical assembly further includes an optical device carrier, and the optical processing assembly and the photoelectric chips are disposed on the optical device carrier; the optical device carrier is fixed in the first housing.

8. The optical module according to claim 7, wherein the optical device carrier has a first carrying surface, the lens group between the wavelength division multiplexer and the optical receptacle is a third lens group, and the third lens group is fixed to the first carrying surface.

9. The optical module according to claim 1, wherein,

the lens group between the wavelength division multiplexer and the optical receptacle is a third lens group; the optical receptacle includes a sleeve assembly and an optical fiber ferrule, the optical fiber ferrule is disposed at one end of the sleeve assembly adjacent to the optical processing assembly, and another end of the sleeve assembly away from the optical processing assembly is used to receive an optical fiber ferrule of an external optical fiber when connecting to an external optical fiber;

the one end of the sleeve assembly adjacent to the optical processing assembly has an extension structure, and the third lens group is mounted on the extension structure.

10. The optical module according to claim 1, wherein the optical receptacle is fixed in the first housing.