CLAIMS

1. A powered device (PD), comprised in a Power over Ethernet (PoE) system, said PD comprising an Ethernet port, a rectifier circuit, and a PD circuit, wherein

the Ethernet port comprises a first contact pair, a second contact pair, a third contact pair, and a fourth contact pair, wherein the first contact pair is configured to connect to a cable pair 1-2 of an Ethernet cable; the second contact pair is configured to connect to a cable pair 3-6 of the Ethernet cable; the third contact pair is configured to connect to a cable pair 4-5 of the Ethernet cable; and the fourth contact pair is configured to connect to a cable pair 7-8 of the Ethernet cable;

the rectifier circuit comprises four metal-oxide semiconductor field-effect transistors (MOSFET) and at least four diodes, wherein

the four MOSFETs are a first MOSFET, a second MOSFET, a third MOSFET, and a fourth MOSFET;

the at least four diodes comprise a first diode, a second diode, a third diode, and a fourth diode;

the first contact pair is connected to an anode of the first diode, and is connected to a first end of the first MOSFET;

the second contact pair is connected to a cathode of the second diode, and is connected to a first end of the second MOSFET;

the third contact pair is connected to a cathode of the third diode, and is connected to a first end of the third MOSFET;

the fourth contact pair is connected to an anode of the fourth diode, and is connected to a first end of the fourth MOSFET;

a power input positive electrode of the PD circuit is connected to a cathode of the first diode, is connected to a second end of the second MOSFET, is connected to a second end of the third MOSFET, and is connected to a cathode of the fourth diode; and

a power input negative electrode of the PD circuit is connected to a second end of the first MOSFET, is connected to an anode of the second diode, is connected to an anode of the third diode, and is connected to a second end of the fourth MOSFET, wherein

a gate electrode of the first MOSFET is connected to the second contact pair;

a gate electrode of the second MOSFET is connected to the first contact pair;

a gate electrode of the third MOSFET is connected to the fourth contact pair; and

a gate electrode of the fourth MOSFET is connected to the third contact pair.

2. The PD according to claim 1, wherein the first MOSFET is an N-type MOSFET; the

second MOSFET is a P-type MOSFET; the third MOSFET is a P-type MOSFET; and the fourth MOSFET is an N-type MOSFET.

3. The PD according to claim 2, wherein the first end of the first MOSFET is a drain electrode of the first MOSFET; the second end of the first MOSFET is a source electrode of the first MOSFET; the first end of the second MOSFET is a drain electrode of the second MOSFET; the second end of the second MOSFET is a source electrode of the second MOSFET; the first end of the third MOSFET is a drain electrode of the third MOSFET; the second end of the third MOSFET is a source electrode of the third MOSFET; the first end of the fourth MOSFET is a drain electrode of the fourth MOSFET; and the second end of the fourth MOSFET is a source electrode of the fourth MOSFET.

4. The PD according to claim 3, wherein the rectifier circuit further comprises a first control circuit (210) and a second control circuit (240);

the gate electrode of the first MOSFET is connected to the second contact pair through the first control circuit;

the gate electrode of the fourth MOSFET is connected to the third contact pair through the second control circuit;

the first control circuit is configured to: when a value obtained by subtracting an electric potential of the first contact pair from an electric potential of the second contact pair is greater than a first voltage threshold, turn on the first MOSFET; and when the value obtained by subtracting the electric potential of the first contact pair from the electric potential of the second contact pair is less than the first voltage threshold, cut off the first MOSFET, wherein an absolute value of the first voltage threshold is greater than that of a maximum Power over Ethernet PoE detection voltage and less than or equal to that of a minimum PoE supply voltage; and

the second control circuit is configured to: when a value obtained by subtracting an electric potential of the fourth contact pair from an electric potential of the third contact pair is greater than a second voltage threshold, turn on the fourth MOSFET; and when the value obtained by subtracting the electric potential of the fourth contact pair from the electric potential of the third contact pair is less than the second voltage threshold, cut off the fourth MOSFET, wherein an absolute value of the second voltage threshold is greater than that of the maximum PoE detection voltage and greater than or equal to the absolute value of the minimum PoE supply voltage.

5. The PD according to any one of claims 1 to 4, wherein the PD is a type-4 PD.