

## WHAT IS CLAIMED IS:

1. An electronic device, comprising:  
a coil, a chip with a contact-less function, a rectifier and a switcher, wherein  
5 the switcher is connected between the coil and the chip, a first output terminal of the coil is electrically connected to a first input terminal of the rectifier and is electrically connected to a second input terminal of the chip via the switcher, wherein  
the coil is configured to sense a field and to output an alternating current (AC) signal via the first output terminal;  
10 the rectifier is configured to receive the AC signal input by the coil via the first input terminal, and to output electric power via a second output terminal of the rectifier; and  
the switcher is configured to connect the coil to the chip under an input operating voltage, and to control connection and disconnection of the coil and the chip according  
15 to a control signal when the control signal is received.
2. The electronic device according to claim 1, wherein the input operating voltage is greater than or equal to a voltage output by the rectifier.
- 20 3. The electronic device according to any of claims 1-2, wherein the rectifier is electrically connected to the switcher and is configured to provide the input operating voltage to the switcher.
4. The electronic device according to any of claims 1-3, wherein the switcher is  
25 electrically connected to a control terminal of the chip and is configured to receive the control signal output via the control terminal of the chip.
5. The electronic device according to any of claims 1-3, further comprising:

a microcontroller unit (MCU), wherein the switcher is electrically connected to a control terminal of the MCU and is configured to receive the control signal output via the control terminal of the MCU.

5           6. The electronic device according to any of claims 1-5, further comprising:

a rechargeable battery, wherein the rectifier is electrically connected to the rechargeable battery and is configured to provide the electric power to the rechargeable battery.

10           7. The electronic device according to any of claims 1-6, wherein the switcher comprises: an AC input terminal, a third output terminal, a control module, a first ON/OFF module and a second ON/OFF module, wherein

the first ON/OFF module is provided to couple a first end of the AC input terminal and a first end of the third output terminal, and is configured to be controlled to transfer  
15 to an ON state or an OFF state, wherein a first path between the first end of the AC input terminal and the first end of the third output terminal is switched on and a second path between the first end of the AC input terminal and the first end of the third output terminal is switched off when the first ON/OFF module is in the ON state, the first path between the first end of the AC input terminal and the first end of the third output  
20 terminal is switched off and the second path between the first end of the AC input terminal and the first end of the third output terminal is switched on when the first ON/OFF module is in the OFF state, the first path and the second path are in opposite flow directions, and the first path is a path from the first end of the AC input terminal to the first end of the third output terminal or a path from the first end of the third output  
25 terminal to the first end of the AC input terminal;

the second ON/OFF module is provided to couple a second end of the AC input terminal and a second end of the third output terminal, and is configured to be controlled to transfer to an ON state or an OFF state, wherein a third path between the second end of the AC input terminal and the second end of the third output terminal is  
30 switched on and a fourth path between the second end of the AC input terminal and the

second end of the third output terminal is switched off when the second ON/OFF module is in the ON state, the third path between the second end of the AC input terminal and the second end of the third output terminal is switched off and the fourth path between the second end of the AC input terminal and the second end of the third output terminal is switched on when the second ON/OFF module is in the OFF state, the third path and the fourth path are in opposite flow directions, and the third path is a path from the second end of the AC input terminal to the second end of the third output terminal or a path from the second end of the third output terminal to the second end of the AC input terminal; and

the control module is provided to couple the input operating voltage of the switcher and a common ground, and is configured to be controlled to transfer to an ON state or an OFF state, wherein the control module is configured to control the first ON/OFF module and the second ON/OFF module to transfer to the OFF state when the control module is in the ON state, and to control one of the first ON/OFF module and the second ON/OFF module to transfer to the ON state and the other one of the first ON-OFF module and the second ON-OFF module to transfer to the OFF state by cooperating with the AC input terminal when the control module is in the OFF state.

8. The electronic device according to claim 7, wherein the first ON/OFF module comprises a first controllable switch and a first freewheeling conduction element.

9. The electronic device according to claim 8, wherein

the first controllable switch comprises: a first connecting end, a second connecting end and a control end, wherein

the first freewheeling conduction element is connected between the first connecting end of the first controllable switch and the second connecting end of the first controllable switch, and a conducting direction of the first freewheeling conduction element is opposite to that of the first controllable switch; and

the first connecting end of the first controllable switch is configured to be connected to the first end of the AC input terminal, the second connecting end of the

first controllable switch is configured to be connected to the first end of the third output terminal, the control end of the first controllable switch is configured to receive the control signal from the control module and to switch on or switch off the first path between the first end of the AC input terminal and the first end of the third output terminal according to the control signal, wherein the first path is a path from the first end of the AC input terminal to the first end of the third output terminal or a path from the first end of the third output terminal to the first end of the AC input terminal.

10. The electronic device according to any of claims 7-9, wherein the second ON/OFF module comprises a second controllable switch and a second freewheeling conduction element.

11. The electronic device according to claim 10, wherein the second controllable switch comprises: a first connecting end, a second connecting end and a control end, the second freewheeling conduction element is connected between the first connecting end of the second controllable switch and the second connecting end of the second controllable switch, and a conducting direction of the second controllable switch is opposite to that of the second freewheeling conduction element; and

the first connecting end of the second controllable switch is configured to be connected to the second end of the AC input terminal, the second connecting end of the second controllable switch is configured to be connected to the second end of the third output terminal, the control end of the second controllable switch is configured to receive the control signal from the control module and to switch on or switch off the third path between the second end of the AC input terminal and the second end of the third output terminal according to the control signal, wherein the third path is a path from the second end of the AC input terminal to the second end of the third output terminal or a path from the second end of the third output terminal to the second end of the AC input terminal.

12. The electronic device according to any of claims 7-11, wherein  
the first ON/OFF module comprises a first enhanced MOSFET, and/or, the second  
ON/OFF module comprises a second enhanced MOSFET.

5        13. The electronic device according to claim 12, wherein  
the first ON/OFF module further comprises: a first load component, wherein a grid  
electrode of the first enhanced MOSFET is connected to the control module via the first  
load component; and/or  
the second ON/OFF module further comprises: a second load component, wherein  
10    a grid electrode of the second enhanced MOSFET is connected to the control module  
via the second load component.

14. The electronic device according to claim 13, wherein  
the first load component is a resistor or a first unidirectional conduction element,  
15    wherein the first unidirectional conduction element comprises a diode or a triode; and  
the second load component is a resistor or a second unidirectional conduction  
element, wherein the second unidirectional conduction element comprises a diode or a  
triode.

20        15. The electronic device according to claim 8 or 9, wherein the first controllable  
switch comprises a first MOSFET and a first bias resistor.

16. The electronic device according to claim 15, wherein the first MOSFET is an  
N-channel MOSFET, a source electrode of the first MOSFET is configured as the first  
25    connecting end of the first controllable switch, a drain electrode of the first MOSFET is  
configured as the second connecting end of the first controllable switch, a grid electrode  
of the first MOSFET is configured as the control end of the first controllable switch, a  
terminal of the first bias resistor is connected to the source electrode of the first  
MOSFET, and the other terminal of the first bias resistor is connected to the grid  
30    electrode of the first MOSFET.

17. The electronic device according to claim 15 or 16, wherein the first controllable switch further comprises: a third load component, wherein the grid electrode of the first MOSFET is connected to the control module via the third load component.

18. The electronic device according to claim 17, wherein the third load component is a resistor or a third unidirectional conduction element, wherein the third unidirectional conduction element comprises a diode or a triode.

19. The electronic device according to claim 10 or 11, wherein the second controllable switch comprises a second MOSFET and a second bias resistor.

20. The electronic device according to claim 19, wherein the second MOSFET is an N-channel MOSFET, a source electrode of the second MOSFET is configured as the first connecting end of the second controllable switch, a drain electrode of the second MOSFET is configured as the second connecting end of the second controllable switch, a grid electrode of the second MOSFET is configured as the control end of the second controllable switch, a terminal of the second bias resistor is connected to the source electrode of the second MOSFET, and the other terminal of the second bias resistor is connected to the grid electrode of the second MOSFET.

21. The electronic device according to claim 19, wherein the second controllable switch further comprises: a fourth load component, wherein the grid electrode of the second MOSFET is connected to the control module via the fourth load component.

22. The electronic device according to claim 21, wherein the fourth load component is a resistor or a fourth unidirectional conduction element, wherein the fourth unidirectional conduction element comprises a diode or a triode.

23. The electronic device according to claim 22, wherein the control module is a controllable switch comprising a first connecting end, a second connecting end and a control end, wherein the first connecting end of the control module is configured to be connected to the input operating voltage, the second connecting end of the control module is configured to be connected to a common ground, the control end of the control module is configured to receive the control signal from outside and to switch on or switch off according to the control signal, and the first connecting end of the control module is further configured to be connected to the first ON/OFF module and the second ON/OFF module respectively, and the control module is configured to control the first ON/OFF module and the second ON/OFF module to transfer to the OFF state when the control module is in the ON state, and to control either one of the first ON/OFF module and the second ON/OFF module to transfer to the ON state by cooperating with the AC input terminal when the control module is in the OFF state.

24. The electronic device according to claim 23, wherein the control module comprises a third MOSFET and a third bias resistor.

25. The electronic device according to claim 24, wherein the third MOSFET is an N-channel MOSFET, a drain electrode of the third MOSFET is configured as the first connecting end of the control module and is connected to the input operating voltage via the third bias resistor, a source electrode of the third MOSFET is configured as the second connecting end of the control module, a grid electrode of the third MOSFET is configured as the control end of the control module.

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