CLAIMS

1. An optical receiver for receiving at least one optical signal, comprising:

a dielectric non-conductive substrate,

a ground plane placed on the dielectric non-conductive substrate,

at least one photodiode placed on the dielectric non-conductive substrate, wherein the at least one photodiode is adapted to receive the at least one optical signal, to convert the received optical signal in an electrical signal, and to output the electrical signal,

at least one amplifier adapted to receive at an input thereof the electrical signal output by the at least one photodiode, and

at least one first opening provided in the ground plane,

wherein the at least one first opening surrounds the at least one photodiode, and

the at least one first opening has a resonance frequency that is sufficiently higher than a predetermined fundamental frequency so as to reduce crosstalk at the input of the amplifier below a predetermined value.

2. The optical receiver according to claim 1, wherein said resonance frequency is sufficiently higher than three times of said predetermined fundamental frequency.

3. The optical receiver according to claim 2, wherein said resonance frequency is 50 GHz or more.

4. The optical receiver according to any of claims 1 to 3, wherein the predetermined fundamental frequency corresponds to the fundamental frequency of the at least one optical signal.

5. The optical receiver according to any of claims 1 to 4, wherein the electrical signal received at the input of the at least one amplifier is single ended.

6. The optical receiver according to any of claims 1 to 5, further comprising at least one second opening provided in the ground plane, wherein the at least one second opening does not surround a photodiode and is placed next to the at least one first opening.

7. The optical receiver according to claim 1 or 2, wherein the optical receiver is adapted to receive a plurality of optical signals of the same fundamental frequency, the optical receiver comprises:

a plurality of photodiodes placed on the dielectric non-conductive substrate, wherein each photodiode of the plurality of photodiodes is adapted to receive an optical signal of the plurality of optical signals, to convert the received optical signal in a respective electrical signal, and to output the respective electrical signal,

a plurality of amplifiers, wherein each amplifier of the plurality of amplifiers is adapted to receive at an input thereof an electrical signal output by a respective photodiode of the plurality of photodiodes,

a plurality of first openings provided in the ground plane,

wherein each opening of the plurality of first openings surrounds at least one photodiode of the plurality of photodiodes, and

each opening of the plurality of first openings has a resonance frequency that is sufficiently higher than three times of the predetermined fundamental frequency so as to reduce crosstalk at the input of each amplifier of the plurality of amplifiers below a predetermined value.

8. The optical receiver according to claim 7, wherein the predetermined fundamental frequency corresponds to the fundamental frequency of the plurality of optical signals.

9. The optical receiver according to claim 7 or 8, wherein the plurality of optical signals includes four optical signals, the plurality of diodes includes four diodes, the

plurality of amplifiers includes four amplifiers, the plurality of first openings includes four first openings, and the predetermined fundamental frequency is 12.5 GHz.

10. The optical receiver according to claim 9, wherein each opening of the four first openings has a substantially rectangular shape and dimensions of approximately 0.3 mm times 0.25 mm.

11. The optical receiver according to any of claims 7 to 10, wherein the plurality of photodiodes and/or the plurality of amplifiers is linearly arranged in an array.

12. The optical receiver according to any of claims 7 to 11, further comprising a plurality of second openings provided in the ground plane, wherein each opening of the plurality of second openings does not surround a photodiode and is placed next to an opening of the plurality of first openings.

13. The optical receiver according to any of claims 1 to 12, wherein the optical receiver is adapted to receive data at a predetermined bit rate, and the predetermined fundamental frequency corresponds to the predetermined bit rate.

14. A transceiver comprises:

an optical receiver according to any of claims 1 to 6,

at least one laser diode,

at least one driver adapted to output a single ended electric signal to an input of the at least one laser diode,

wherein the fundamental frequency of the single ended electric signal output by the at least one driver corresponds to the predetermined fundamental frequency,

the at least one laser diode is adapted to output an optical signal in accordance with the single ended electric signal received at its input, and

the optical receiver, the at least one driver and the at least one laser diode are provided on the dielectric non-conductive substrate and surrounded by the ground plane.

15. A transceiver comprises:

an optical receiver according to any of claims 7 to 12,

a plurality of laser diodes,

a plurality of drivers, each driver of the plurality of drivers is adapted to output a single ended electrical signal to an input of a laser diode of the plurality of laser diodes,

wherein the fundamental frequency of the single ended electric signals output by the drivers of the plurality of drivers corresponds to the predetermined fundamental frequency,

each laser diode of the plurality of laser diodes is adapted to output an optical signal in accordance with the single ended electrical signal received at its input, and

the optical receiver, the plurality of drivers and the plurality of laser diodes are provided on the dielectric non-conductive substrate and surrounded by the ground plane.

CLAIMS

1. An optical receiver for receiving at least one optical signal having a first fundamental frequency, comprising:

a dielectric non-conductive substrate,

a ground plane placed on the dielectric non-conductive substrate,

at least one photodiode placed on the dielectric non-conductive substrate, wherein the at least one photodiode is adapted to receive the at least one optical signal, to convert the received optical signal in an electrical signal, and to output the electrical signal,

at least one amplifier adapted to receive at an input thereof the electrical signal output by the at least one photodiode and a crosstalking signal having a second fundamental frequency, and

at least one first opening provided in the ground plane,

wherein the at least one first opening surrounds the at least one photodiode, characterized in that the at least one first opening does not show a resonance effect at the second fundamental frequency and at a multiple thereof, particularly at a triple thereof.

2. The optical receiver according to claim 1, wherein the at least one first opening has a resonance frequency that is higher than three times of said second fundamental frequency.

3. The optical receiver according to claim 2, wherein said resonance frequency is 50 GHz or more.

4. The optical receiver according to any of claims 1 to 3, wherein the electrical signal received at the input of the at least one amplifier is single ended.

5. The optical receiver according to any of claims 1 to 4, further comprising at least one second opening provided in the ground plane, wherein the at least one second opening does not surround a photodiode and is placed next to the at least one first opening.

6. The optical receiver according to claim 1 or 2, wherein the optical receiver is adapted to receive a plurality of optical signals, each optical signal of the plurality of optical signals having the first fundamental frequency, the optical receiver comprising:

a plurality of photodiodes placed on the dielectric non-conductive substrate, wherein each photodiode of the plurality of photodiodes is adapted to receive an optical signal of the plurality of optical signals, to convert the received optical signal in a respective electrical signal, and to output the respective electrical signal,

a plurality of amplifiers, wherein each amplifier of the plurality of amplifiers is adapted to receive at an input thereof an electrical signal output by a respective photodiode of the plurality of photodiodes and a crosstalking signal having a second fundamental frequency,

a plurality of first openings provided in the ground plane,

wherein each opening of the plurality of first openings surrounds at least one photodiode of the plurality of photodiodes, and

each opening of the plurality of first openings does not show a resonance effect at the second fundamental frequency and at a multiple thereof, particularly at a triple thereof.

7. The optical receiver according to claim 6, wherein the resonance frequency of each opening of the plurality of first openings is higher than three times of the second fundamental frequency.

8. The optical receiver according to any of claims 1 to 7, wherein the second fundamental frequency is identical to the first fundamental frequency.

9. The optical receiver according to any of claims 6 to 8, wherein the plurality of optical signals includes four optical signals, the plurality of photodiodes includes four

photodiodes, the plurality of amplifiers includes four amplifiers, the plurality of first openings includes four first openings, the second fundamental frequency is 12.5 GHz, and the resonance frequency of each opening of the plurality of first openings is 50 GHz or more.

10. The optical receiver according to claim 9, wherein each opening of the four first openings has a substantially rectangular shape and dimensions of approximately 0.3 mm times 0.25 mm.

11. The optical receiver according to any of claims 6 to 10, wherein the plurality of photodiodes and/or the plurality of amplifiers is linearly arranged in an array.

12. The optical receiver according to any of claims 6 to 11, further comprising a plurality of second openings provided in the ground plane, wherein each opening of the plurality of second openings does not surround a photodiode and is placed next to an opening of the plurality of first openings.

13. The optical receiver according to any of claims 1 to 12, wherein the optical receiver is adapted to receive data at a predetermined bit rate, particularly 25 Gbps, and the second fundamental frequency corresponds to the predetermined bit rate.

14. A transceiver comprising:

an optical receiver according to any of claims 1 to 6,

at least one laser diode,

at least one driver adapted to output a single ended electric signal to an input of the at least one laser diode,

wherein the fundamental frequency of the single ended electric signal output by the at least one driver corresponds to the second fundamental frequency,

the at least one laser diode is adapted to output an optical signal in accordance with the single ended electric signal received at its input, and

the optical receiver, the at least one driver and the at least one laser diode are provided on the dielectric non-conductive substrate and surrounded by the ground plane.

15. A transceiver comprising:

an optical receiver according to any of claims 7 to 12,

a plurality of laser diodes,

a plurality of drivers, each driver of the plurality of drivers is adapted to output a single ended electrical signal to an input of a laser diode of the plurality of laser diodes,

wherein the fundamental frequency of the single ended electric signals output by the drivers of the plurality of drivers corresponds to the second fundamental frequency,

each laser diode of the plurality of laser diodes is adapted to output an optical signal in accordance with the single ended electrical signal received at its input, and

the optical receiver, the plurality of drivers and the plurality of laser diodes are provided on the dielectric non-conductive substrate and surrounded by the ground plane.