back surface so as to be close to a center of a first side of the back surface; a transmission terminal provided on the back surface so as to be close to a second side of the back surface crossing the first side and to be farther away from the antenna terminal than a center of the second side; a first reception terminal provided on the back surface so as to be close to a third side of the back surface opposite to the second side and to be farther away from the antenna terminal than a center of a third side; a first conductor provided on a first surface of a first layer out of the multiple layers so as to surround at least one of a first area defined by projecting the transmission terminal onto the first layer and a second area defined by projecting the first reception terminal thereon; and a ground terminal provided on a second surface of the first layer opposite to the first surface and located between the transmission terminal and a fourth side opposite to the first side and/or between the first reception terminal and the fourth side.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] FIG. 1A is a perspective view of a duplexer according to ~~claim 1~~a first embodiment, FIG. 1B is a perspective view of the duplexer from which a cap has been removed, FIG. 1C is a perspective view of the duplexer from which a transmission filter and a reception filter have been removed, FIG. 1D is a cross-sectional view taken along a line A-A in FIG. 1A, and FIG. 1E is a cross-sectional view taken along a line B-B in FIG. 1A;

FIG. 2A is a plan view of the transmission filter or the reception filter, and FIG. 2B is a circuit diagram of the filter;

FIG. 3A is a plan view of an acoustic wave resonator; and FIG. 3B is a cross-sectional

terminal 52 on the lower side of the layer 30, and pad D is electrically connected to a first reception terminal 54 thereon. Pads E1 ~ E3, F1 ~ F3 and G1 ~ G2 are connected to ground terminals 56 on the lower surface of the layer 30. Vias pass through the die attach layer 26 and are full of an alloy of Al and Cu, for example. The vias electrically connect the conductive pattern 20 formed on the upper surface of the die attach layer 26 and the conductive pattern formed on the upper surface of the line pattern layer 28 together. Vias V1 ~ V11 that appear on the upper surface of the die attach layer 26 are connected to vias V1 ~ V11 that appear on the upper surface of the line pattern layer 28. The line pattern includes lines for connecting the bump pads and the vias together.

[0015] As illustrated in FIG. 4C, a conductive pattern 20 including lines and vias is formed on the upper surface of the line pattern layer 28. The lines connect the vias. The vias that pass through the line pattern layer 28 electrically interconnect the conductive pattern form on the upper surface of the line pattern layer 28 and the conductive pattern 20 formed on the upper surface of the line pattern/foot pad layer 30. Vias V1 ~ V4, V11 and W1 ~ W3 that appear on the upper surface of the line pattern layer 28 are connected to vias V1 ~ V4, V11 and W1 ~ W3 that appear on the upper surface of the line pattern/foot pad layer 30.

[0016] As illustrated in FIG. 4D, a conductive pattern 20 including a line and vias is formed on the upper surface of the line pattern/foot pad layer 30. A first conductor 46 is provided so as to surround an area virtually formed by projecting the transmission terminal 52 provided on the lower surface of the line pattern/foot pad layer 30 on the upper surface thereof (an area illustrated by a broken line in FIG. 4D~~5D~~). The first conductor 46 may be made of the same material as that

transmission terminal 52 is three-dimensionally shielded by additionally providing the first conductor 46 surrounding the area virtually formed by projecting the transmission terminal 52 and the ground terminal 56 between the transmission terminal 52 and the fourth side 64.

[0026] As described above, according to the first embodiment, the first conductor 46 is provided on the upper surface of the line pattern/foot pad layer 30 so as to surround the area virtually formed by projecting the transmission terminal 52 thereon, as illustrated in FIG. 4D. Further, as illustrated in FIG. 4E, the ground terminal 56 is provided between the transmission terminal 52 and the fourth side 64 on the lower surface of the multilayer substrate 10 (that is, the lower surface of the line pattern/foot pad layer 30) in addition to the ground terminal 56 provided in the vicinity of the center of the second side 60 and the ground terminal provided in the vicinity of the center of the fourth side 64. Thus, on the lower surface of the multilayer substrate 10 and the upper surface of the line pattern/foot pad layer 30, the transmission terminal 52 is electromagnetically shielded in both the direction towards the first reception terminal 54 and the direction orthogonal thereto. It is thus possible to block the electromagnetic wave propagating towards the first reception terminal 54 from the transmission terminal 52 and that in the direction orthogonal thereto. It is to be noted that the ~~magnetic~~electromagnetic wave particularly tends to be radiated towards the side of the transmission signal line 70 of the printed-circuit board 66. Thus, the electromagnetic wave can be blocked by the ground terminal 56 provided between the transmission terminal 52 and the fourth side 64 in addition to the ground terminal 56 provided in the vicinity of the center of the second side 60. It is thus possible to reduce the electromagnetic coupling between the transmission terminal 52 and the first reception terminal 54 and to improve

in the cap mount layer 22 and the cavity layer 24. The transmission filter 12 of the ladder type and the reception filter 14 of the double mode type are housed in the cavity 18.

[0070] As illustrated in FIGs. 26B and 26C, the conductive patterns 20 are provided on the upper surface of the die attach layer 26 and the upper surface of the line pattern layer 28.

[0071] As illustrated in FIG. 26D, in addition to the conductive pattern 20, the first conductor 46 is provided on the upper surface of the line pattern/foot pad layer 30 so as to surround the area defined by projecting the transmission terminal 52 and the area defined by projecting the first reception terminal 54 closer to the transmission terminal 52 ~~and~~than the second reception terminal 55.

[0072] As illustrated in FIG. 26E, the first reception terminal 54 is provided close to the third side 62 and is located farther away from the antenna terminal 50 than the center of the third side 62. The second reception terminal 55 is provided close to the center of the third side 62 and is next to the first reception terminal 54. Thus, the ground terminal 56 is not provided close to the center of the third side 62. This is different from the arrangements illustrated in FIGs. 4E and 16E. The other structures of the seventh embodiment are the same as those of the third embodiment illustrated in FIG. 16E, and a description thereof is omitted here.

[0073] FIG. 27A is a perspective view of the duplexer of the seventh embodiment, and FIG. 27B is a perspective view of an electronic device in which the duplexer is mounted on a printed-circuit board. As illustrated in FIG. 27A, the first reception terminal 54 is provided close to the third side 62 and is located farther away from the antenna terminal 50 than the center of the third side 62. The second reception terminal 55 is provided close to the center of the