ABSTRACT

SOLID-STATE IMAGE PICKUP ELEMENT, SOLID-STATE IMAGE PICKUP DEVICE AND PRODUCTION METHOD THEREFOR

It is intended to provide a solid-state image pickup element capable of reducing an area of a read channel to increase a ratio of a surface area of a light-receiving section to the overall surface area of one pixel. The solid-state image pickup element comprises a first-conductive type planar semiconductor layer formed on a second-conductive type planar semiconductor layer, a hole portion formed in the first-conductive type planar semiconductor layer to define a hole therein, a first-conductive type high-concentration impurity region formed in a bottom wall of the hole portion, a first-conductive type high-concentration impurity-doped element isolation region formed in a part of a sidewall of the hole portion and connected to the first-conductive type high-concentration impurity region, a second-conductive type photoelectric conversion region formed beneath the first-conductive type high-concentration impurity region and in a part of a lower region of the remaining part of the sidewall of the hole portion, and adapted to undergo a change in charge amount upon receiving light, a transfer electrode formed on the sidewall of the hole portion through a gate dielectric film, a second-conductive type CCD channel region formed in a top surface of the first-conductive type planar semiconductor layer and in a part of an upper region of the remaining part of the sidewall of the hole portion, and a read channel formed in a region of the first-conductive type planar semiconductor layer sandwiched between the second-conductive type photoelectric conversion region and the second-conductive type CCD channel region.

(Figure 4)