

Abstract

Active Matrix Circuit Board, Thin-Film Transistor, And A Manufacturing Method For These

In the formation of a thin-film transistor (620) capable of improving the OFF current characteristic, first, all ions (arrow Ion-1) generated from a mixed gas (doping gas) containing 5% PH_3 with the remainder being H_2 gas are implanted to a polycrystalline silicon film (604) at an approximately 80 keV energy level to achieve a P^+ ion dose in the range from $3 \times 10^{13}/\text{cm}^2$ to $1 \times 10^{14}/\text{cm}^2$ in the process forming low concentration source-drain areas (602, 603). Next, all ions generated from a doping gas of pure hydrogen (arrow Ion-2) are implanted to the low concentration area (604a) at an approximately 20 keV energy level to achieve an H^+ ion dose from $1 \times 10^{14}/\text{cm}^2$ to $1 \times 10^{15}/\text{cm}^2$. Then, the impurity is activated by heat treatment of the low concentration area (604a) implanted with impurity for approximately one hour at approximately 300°C in a nitrogen atmosphere.

Fig.1.

