CLAIMS

1. A method of producing a silicon epitaxial wafer, comprising:

a step of pulling up a silicon single crystal;

a step of slicing the silicon single crystal to form silicon wafers;

a step of heating the silicon wafers; and

a step of forming an epitaxial layer on the silicon wafer,

wherein in the step of pulling up the silicon single crystal, nitrogen concentration of the single crystal is set to be 1×10^{11} to 2×10^{13} atoms/cm^3, oxygen concentration thereof is set to be 9.5×10^{17} to 13.5×10^{17} atoms/cm^3 (ASTM F123-1979), a crystal cooling rate is set to be about 4.2°C/min at a temperature of a silicon melting point to 1350°C and is set to be about 3.1°C/min at a temperature of 1200°C to 1000°C,

wherein in the step of heating the silicon wafers, the silicon water is heated under conditions of 850°C or higher and lower than 900°C for about 30 min,

wherein after the step of forming the epitaxial layer on the silicon wafer, oxygen precipitate density in a case where a heat treatment for oxygen precipitation evaluation is performed at 780°C for 3 hours and is performed at 1000°C for 16 hours is set to be 1×10^{8} to 5×10^{9} pieces/cm^3.

2. The method of producing a silicon epitaxial wafer according to Claim 1,

wherein the oxygen concentration is set to be high on a top side of the silicon single crystal and set to be low on a tail side of the silicon single crystal.

3. A silicon epitaxial wafer, comprising: a silicon wafer and an epitaxial layer formed on a surface of the silicon wafer,

wherein oxygen concentration in a silicon wafer is set to be 9.5×10^{17} to 13.5×10^{17} atoms/cm^3 (ASTM F123-1979),

wherein oxygen precipitate density in the silicon wafer in a case where a heat treatment for oxygen precipitation evaluation is performed at 780°C for 3 hours and is performed at 1000°C for 16 hours is 1×10^{8} to 5×10^{9} pieces/cm^3, and

wherein slips do not occur in a case where very short-time annealing is performed at a temperature of 1150°C to 1200°C for 0.7 to 1.1 milliseconds.

4. The silicon epitaxial wafer according to Claim 3,

wherein defect density on a surface of the epitaxial layer is equal to or less than 0.01 pieces/cm^2.