WHAT IS CLAIMED IS:

1. An SiC wafer producing method for producing an SiC wafer from a single crystal SiC ingot having a first surface, a second surface opposite to the first surface, a c-axis extending from the first surface to the second surface, and a c-plane perpendicular to the c-axis, the c-axis being inclined by an off angle with respect to a normal to the first surface, the off angle being formed between the c-plane and the first surface, the SiC wafer producing method comprising:

a modified layer forming step of setting a focal point of a pulsed laser beam having a transmission wavelength to SiC inside the SiC ingot at an initial depth from the first surface and applying the pulsed laser beam to the SiC ingot while relatively moving the SiC ingot and the focal point at the initial depth in a first direction through an initial area until a power density of the pulsed laser beam reaches a predetermined value at a predetermined depth from the first surface, the initial depth being greater than the predetermined depth from the first surface, and next applying the pulsed laser beam with the power density at the predetermined value to the SiC ingot as relatively moving the SiC ingot and the focal point at the initial depth through a stable area in the first direction perpendicular to a second direction where the off angle is formed, thereby forming a linear modified layer inside the SiC

ingot that rises from the initial depth to the predetermined depth in the initial area and that extends at the predetermined depth in the stable area, so as to extend in the first direction and cracks extending from the modified layer in opposite directions along the c-plane, the modified layer being formed in such a manner that SiC is decomposed into Si and C by the pulsed laser beam first applied, and the pulsed laser beam next applied is absorbed by C previously produced to continue the decomposition of SiC into Si and C in a chain reaction manner with the relative movement of the SiC ingot and the focal point in the first direction;

a separation surface forming step of relatively indexing the SiC ingot and the focal point in the second direction and performing the modified layer forming step plural times to thereby form a separation surface inside the SiC ingot;

a wafer producing step of separating a part of the SiC ingot along the separation surface as an interface to thereby produce the SiC wafer;

a chamfering step of chamfering the outer circumference of the SiC wafer separated from the SiC ingot, thereby removing a burr formed by the modified layers formed in the initial areas at the outer circumference of the SiC wafer; and

a grinding step of grinding the separation surface of the SiC wafer separated from the SiC ingot after performing the

chamfering step, thereby smoothing the separation surface of the SiC wafer.

2. The SiC wafer producing method as defined in claim 1 wherein a difference between the initial depth and the predetermined depth is approximately 30 to 50 μm.