

ABSTRACT

The present disclosure provides a method for forming an isolation trench, a manufacturing method for a semiconductor device, and a process device. The method for forming an isolation trench includes: providing a to-be-etched object, which includes a substrate, a gate structure, and an isolation dielectric layer, the gate structure and the isolation dielectric layer being located on a surface of the substrate, and the gate structure extending along a first direction and being disposed on a same layer as the isolation dielectric layer; and alternately and cyclically etching the isolation dielectric layer and the gate structure to form a first isolation trench, the first isolation trench penetrating through the gate structure along a second direction, and the first direction being perpendicular to the second direction. The technical solutions of the present disclosure can meet, in a case where feature sizes of semiconductor devices are further reduced, design requirements of the semiconductor devices for high aspect ratio and etching morphology of the isolation trench, thereby facilitating improvement in integration of integrated circuits.