

NANO PATTERNING OF CONE DOTS AND NANO CONSTRICTIONS OF NEGATIVE E-BEAM RESIST FOR SINGLE ELECTRON TRANSISTOR FABRICATION

Abstract

We present an optimization of nano dot of negative tone e-beam resist which is a very important step in single electron transistor fabrication process. The optimum design of dot and nano constriction plays a significant role in determining optimum etching resolution and single electron transistor performance. In this research, we have optimized nano dot and nano constriction dimensions of resist by controlling some parameters, such as e-beam dose, spin speed, pre-bake time and image development time. However, a nano constriction design variety of 120–200 nm in width was carried out to reach the optimum design. In this paper, the fabrication process of cone nano dots using e-beam lithography with considering proximity effect is reported. As nano constriction design decreased, cone nano dot changed to pyramid nano dot and the compression effect on the dot also significantly increased as well.