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Abstract
In this study the ultra-sharp silicon emitters for field emission array（FEA）have been fabricated on silicon wafers using a combination of optical lithography and induction coupling plasma etching（ICP）. In the first, the isotropic etching of silicon are performed to produce neck structures by induction coupling plasma etching method. Next, the silicon neck structures are oxided to produce more sharper emitters by wet oxidation. The gate insulator and gate metal patterns are grown using sputter and electron beam evaporation system, respectively. The shaper emitters are achieve after the oxide masks were removed by lift-off method with buffered HF solutions. The anode plate with ZnS phosphor onto the indium tin oxide（ITO）glass, are carried out by the screen-printing technique. The field emission current and luminescent effect of the field emission arrays are measured. The results show that the turn-on voltage take place at 650V with the turn-on current of 2.853× 10-1U+B5A. The currents are decreased as the work cycles increase.
Keywords：induction coupling plasma etching, field emission array, lift-off, anode plate
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