A new approach of determining dynamic ionic current-voltage characteristic that is due to ion transport phenomenon in the oxide is presented. In this approach, the formulation of I–V characteristics ofmos device can be achieved through the use of the theoretical model of mobile ion distribution in oxides. The used theoretical model of ion distribution is based on the concept that the equilibrium concentration of the ions is obtained when the combined mobilizing forces, namely, thermal diffusion, internal, and external electric fields, become just sufficient to provide necessary activation energy to the ions to surmount the effective potential well. The obtained I–V curve is compared with the experimental curves under varying bias conditions by a slow linear ramp voltage at high temperature (tvs technique). An agreement between the experimental and computed curves provides a support to this method which in turn it gives formulation that is easier to apply for deriving the theoretical I–V characteristic