Abstract： To suppress charge injection from electrodes, direct fluorination using fluorine gas was used for linear low density polyethylene (LLDPE) since it is one of the most effective methods of the polymer surface modification. Surface fluorination of the LLDPE plates was obtained as indicated by attenuated total reflection infrared spectroscopy. Remarkable suppression of charge injection by the surface fluorination was observed by space charge distribution measurements using the pressure wave propagation method. Comparing with the remarkable bipolar charge distribution in bulk of the original LLDPE, there is less space charge in bulk and it mostly exists in the fluorinated surface layers. The possible mechanisms of the charge injection suppression are discussed, one of which, the effect of fluorination on the charge traps in surface layer was investigated by the thermally stimulated discharge technique. The results indicate that fluorination has charge traps in the surface layer remarkably deepened and charges captured in the deep traps can block or shield the further charge injection.