Micro injection moulding is one of the key technologies for micro manufacture due to its mass-production capability and relatively low component cost. Flash defects are among the most critical issues in the replication of micro features and constitute a manufacturing constrain in applying injection moulding in a range of micro engineering applications. In the present research the effects of four processing parameters on the amount of flash on a micro finger test structure were investigated using two different polymer materials and applying DOE approach. In particular, the following process parameters were considered: injection speed, holding pressure, melt temperature and mould temperature. The study revealed that for the materials with lower viscosity the injection speed, followed by barrel temperature, are the most influential parameters for increasing the amount of flash. On the other hand, barrel temperature, injection velocity, and mould temperature resulted as the most influential parameters for increasing the flash amount when moulding with high viscosity materials. Conversely, the holding pressure did not have a clear effect on the flash amount.