Cancer immunotherapy trials have two special features: delayed treatment effect and long-term survivors. Both features violate the proportional hazards (PH) assumption and ignoring either one of the two features in an immunotherapy trial design will result in substantial loss of statistical power. To design immunotherapy trials with long-term survivors, we propose a change sign weighted log-rank test. To design immunotherapy trials with delayed treatment effect, we propose a robust test statistic. A general sample size formula is derived for the weighted long-rank test. The sample size formula is applied to the long-term survivor model and delayed treatment effect model. Simulation studies are conducted to compare the accuracy and efficiency between the proposed designs and traditional designs.