The rotational spectra of CF$_3$CF$_2$CH$_3$ and trans- and gauche-CF$_3$CH$_2$OCH$_3$, constitute alternative compounds to the CFCs, have been studied by microwave spectroscopy. The spectra were measured using Stark modulation and Fourier-transform microwave spectrometers at Shizuoka University. Both molecules exhibited the spectrum due to many excited states of the CF$_3$ torsion. Accurate rotational constants and quartic centrifugal distortion constants have been obtained for the ground and torsional excited states up to $v = 3$. The barrier heights to internal rotation of the CF$_3$ top have been determined for these molecules. Reasonable molecular structures have been derived from the observed rotational constants and were compared with those of ab initio calculations of GAUSSIAN MP2/6-311G** level.