In spite of the rapid technological progress achieved in the development of GaN based devices, p-type doping of GaN still remains an important issue. Magnesium, and recently carbon, are successfully used as acceptor dopants, however, their hole binding energies were never measured directly and only estimated from Hall effect or photoluminescence experiments. The energy values determined from Hall effect measurements depend critically on the degree of compensation, while interpretation of the results of optical studies, such as donor-to-acceptor transitions, require assumptions regarding the donor involved. We present the results of direct photoionization studies of the Mg and C acceptors in cubic phase GaN grown on (100) GaAs substrate by rf plasma-assisted molecular beam epitaxy. In the photo-stimulated current of a lightly Mg doped sample two relatively broad features centered at about 230 and 250 meV were observed. These features were identified with the help of effective-mass model calculations, involving light- and heavy-hole as well as spin orbit split off bands, as due to internal Mg transitions to odd-parity bound states and resonant states, respectively. The determined hole binding energy of the Mg acceptor in cubic phase GaN agrees very well with the value estimated from optical studies. In carbon doped samples no structure in the photo-current spectra was observed. The onset of the photoionization band was found at 150 meV in a lightly C-doped sample and moves towards lower energies with increasing carbon concentration, indicative of a formation of an impurity band.