Carbon nanotubes (CNTs) are low dimensional materials with properties that make them ideal for many nanoscale thermoelectromechanical devices. However, the concepts of sliding friction and interfacial thermal conductance in CNT base materials need to be investigated for the better implementation of these materials in nanodevices. Using equilibrium (Green-Kubo) and NEMD simulations, we investigated the correlations between the friction coefficient $\Gamma$ and the interfacial thermal conductance $G$ in the radial direction of three different double-walled CNTs of different commensurability, each of length 10 nm. We found that each of these transport coefficients obeyed the linear response. A linear relationship with temperature was found for both the transport coefficients. The spectral friction and spectral interfacial conductivity obtained from the Green-Kubo simulations showed highly active modes of same frequency for both the coefficients thereby hinting at the possible same mechanism underlying both the coefficients. The relationship between $\Gamma$ and $G$ was found to be linear allowing us to propose a scaling law of the form $G \propto \Gamma^\alpha$, where $\alpha = 1$. Further work is needed to investigate these correlations under different parameters like defects, tube length etc.