The Sikkim Himalaya lies in the eastern sector of the Himalayan collision belt. Tectonically, the Main Central Thrust (MCT) takes a sinusoidal turn in this region and appears as a thick zone of ductile shear rather than a sharp interface separating the rocks of the Lesser Himalaya and the Higher Himalayan Crystalline Sequence (HHCS). Further north, HHCS consists of high grade gneisses. In the present study, we have carried out broadband and long-period MT survey along a profile lying between 27.5-28N in north Sikkim to delineate the electrical resistivity structure of the crust beneath HHCS. The altitude increases from 1.6 km to 5.0 km from the southern end to the northern end of the profile. Broadband data were acquired at eight locations using induction coils whereas fluxgate magnetometers were used at three locations to acquire long-period data. At most sites, the apparent resistivity and phase curves could be retrieved in the frequency range of $10^3$ – $2.5 \times 10^{-4}$ Hz. Two-dimensional inversion of the dataset reveals the presence of an electrical conductor in the depth range of a few hundred meters to more than 30-40 km within the HHCS, except at the southern end where the entire crust is highly resistive representing high grade gneisses. In contrast, the southern end of the 100-line of the INDEPTH profile, further east of the present profile, shows a high resistivity crust beneath the Higher Himalaya (HH). The presence of conductive crust in north Sikkim needs to be explored in detail for its possible tectonic implications.