The three classical regimes of boiling are imaged for an excess temperature range (above saturation) from about 3°C to 15°C. The microstructure of the heated surface determines the temperature at which transition from nucleate to film boiling occurs (characterized by the forming of a stable vapor film below the pool). This transition on a smooth hydrophobic structure does not occur until about 30°C. The transition occurs at much lower excess temperatures for the rib structured superhydrophobic surface, and nucleate boiling on the post structured surface is completely eliminated, with transition to film boiling occurring at an excess temperature of only 3°C.