It is demonstrated that nonsingular higher-order hierarchical Legendre basis functions are capable of accounting for the singularities of the electric currents at the edges of the reflectarray elements, thus yielding good convergence properties and very accurate results. In addition, the number of Floquet harmonics needed in the spectral domain method of moments is reduced by using higher-order hierarchical Legendre basis functions as compared to singular basis functions. At the same time, higher-order hierarchical Legendre basis functions can be applied to any arbitrarily shaped array elements, thus providing the flexibility required in the analysis of printed reflectarrays. A comparison to DTU-ESA Facility measurements of a reference offset reflectarray shows that higher-order hierarchical Legendre basis functions produce results of the same accuracy as those obtained using singular basis functions.