This paper documents the manufacturing by selective laser sintering of a 20/30 GHz dual-band circularly polarized offset stepped-reflector antenna for K- and Ka-band satellite communication. The manufactured antenna has been measured at the DTU-ESA Spherical Near-Field Antenna Test Facility with a peak directivity of 36.7 dB and 40.4 dB at 20 and 30 GHz, respectively; this corresponds to an aperture efficiency of 61 % and 64 %, respectively. These results demonstrate that 3D printing is a viable manufacturing technology for medium-sized high-frequency antennas.