Antenna systems for broadband polarization diversity reception rank among the emerging key technologies in next generation wireless communication systems. In order to suppress multipath conditioned polarization fading in typical applications of portable radios, antenna modules with dual-polarized transmission behavior are to be used. Self-complementary, logarithmically-periodic antennas serve as suitable representatives for the realization of broadband antenna structures and can be favorably used in polarization diverse transmission systems. Applying usual diversity combination techniques at the receiver, high diversity gains could be achieved over a wide frequency band incorporating planar, dual-polarized log.-per. four-arm antennas.