The evolution of power electronics since the middle of the 20th century has largely depended on the introduction of semiconductor devices. The invention of the SCR in the late 1950s led to the expansion of the field of motor drives both DC and AC. The power MOSFET led to switch-mode power supplies and wide bandgap devices have enabled resonant converters. High-frequency transformers are at the heart of all these topologies and the need for techniques to deal with skin and proximity effects losses has become more acute. This chapter deals with all aspects of transformer design for power electronics applications.