from CMOS digital logic switching, and to suppress high frequency noise.

Other large passive components found on the Xbox motherboard include inductors and resistors. The large wire-wound toroidal (donut-shaped) inductors found on the Xbox motherboard are all part of the power supply subsystem. Inductors store energy as magnetic flux. An inductor's electrical properties are complementary to that of a capacitor. Combinations of inductors and capacitors with transistor switches in between are used to build very efficient power regulators. Most of the resistors on the Xbox motherboard are used either to absorb excess energy at the termination of signal traces, or to bias a wire to a particular logic level.

There are two ways you can identify a passive device on the Xbox motherboard. The first is by the shape of the package. Package shape recognition is feasible because there are so few basic varieties of passive parts. Figure 2-2 has some pictures of the capacitors, inductors and resistors that you might see on an Xbox motherboard. The second method is to read the label next to the part on the motherboard and to infer the part's function by the reference designator using Table 2-1 as a guide.

Active components can amplify signals, and have three or more leads. The simplest active component is a transistor, with three and occasionally four leads (sometimes discrete "MOSFET" transistors have an explicit fourth "body" terminal). The most complicated active components are integrated circuits, such as CPU and memory chips, with hundreds, sometimes thousands, of leads. Integrated circuits come in a wide variety of packages,

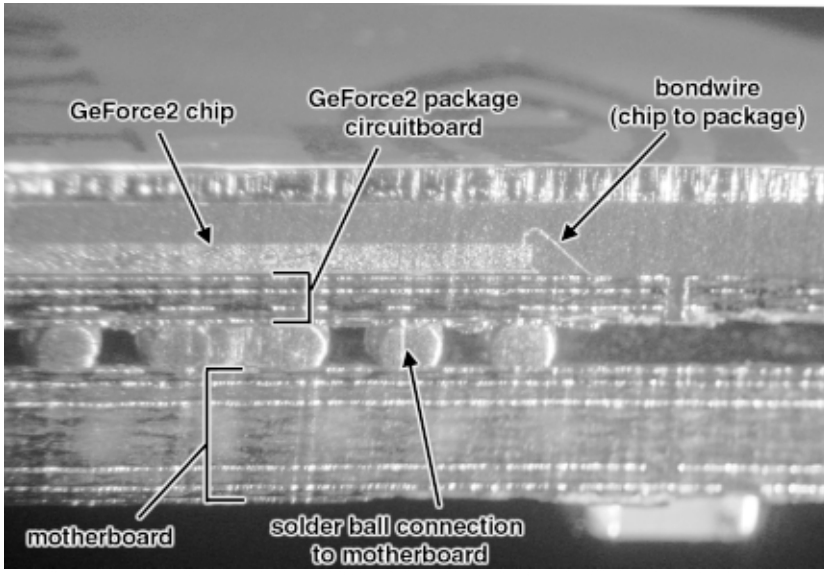

Figure 2-3:
Cross section view of a BGA packaged part (GeForce2) mounted on a motherboard.