The Atmel 3-Volt EPROM Family

- Why 3-volt operation?
- Does the whole system have to be operated at 3 volts?
- How do you program a 3-volt EPROM?
- What happens if you run a 3-volt device at 3.6 volts?

The Atmel AT27LVxxxA series of EPROMs was designed to operate over a wide range of supply voltages from 3.0 to 3.6 volts. This offers the designer the opportunity to take advantage of the greatly reduced power consumption at 3 volts.

The 3-volt series of EPROMs is specified to draw a maximum of 8.0 mA at 5.0 MHz when operated at 3.6VDC. This is less than half of the specified maximum current of a standard EPROM operating at 5.0VDC. Because of the low supply voltage, the power savings calculations are even more dramatic: 29 mW for the LV series compared to 165 mW (5.5V @ 30 mA; i.e. 27C040) for standard five-volt devices. That means much longer battery life.

The LV series has CMOS inputs and outputs specified for TTL levels and 3-volt CMOS levels (Rail-to-Rail). In other words, an LV device with V_{CC} = 3.0VDC can drive standard 5-volt TTL logic devices on its data output lines making interface with 5-volt logic easy. The LV series of EPROMs can even be safely driven by 5-volt signals, even though their V_{CC} is at 3.0VDC (please refer to application note *Interfacing Atmel LV EPROMs on a Mixed Three-Volt/Five-Volt Data Bus*, this chapter). The next question that comes to mind is “Why run just one EPROM at 3 volts while the rest of the system uses 5 volts?” One reason is if your system is on a very tight power budget, such as battery operated equipment, daughter boards or phone line powered products, the **six times** power savings might make a significant difference. Of course your design might use more than one EPROM, for map memory, operating system, font storage or maybe smart cards. In this case the total power savings can be very large. Remember at 165 mW each, 8 EPROMs at 5 volts use 1.3 Watts instead of 235 mW for the 3-volt devices!

When the 3-volt devices are in a programmer they work just like their standard Atmel 5-volt counterparts. Absolutely no difference! Programming support is already in place and widely available on most programmers on the market today.

The AT27LVxxxA series of EPROMs are specified to operate from 3.0 to 3.6 volts. So what happens when the device is operated above 3 volts? It speeds up and draws more power, but never more than a standard EPROM. This feature offers the most flexibility for system manufacturers.

Low Voltage OTP EPROM

Rev. 0546A–10/98