Providing an Ideal External Program Memory Solution for the Atmel 89XXX Microcontrollers

The Atmel AT27C520 EPROM, with its 64K Bytes of storage, combined with a novel multiplexed address/data scheme and an internal latch pin, make it the ideal External Program Memory storage solution for the Atmel AT89XXX Micro-Controller family. A simple scheme can be constructed where the AT89XXX P0 port serves as both the lower order address byte (to the EPROM) as well as the data bus (from the EPROM), while the P2 port serves as the high order address byte (to the EPROM). Additionally, the AT27C520 can be accessed in less than 90 nS. max. eliminating wasteful wait states. Figure 1 shows the necessary block diagram. Table 1 contains the necessary interface connections.

Figure 1.

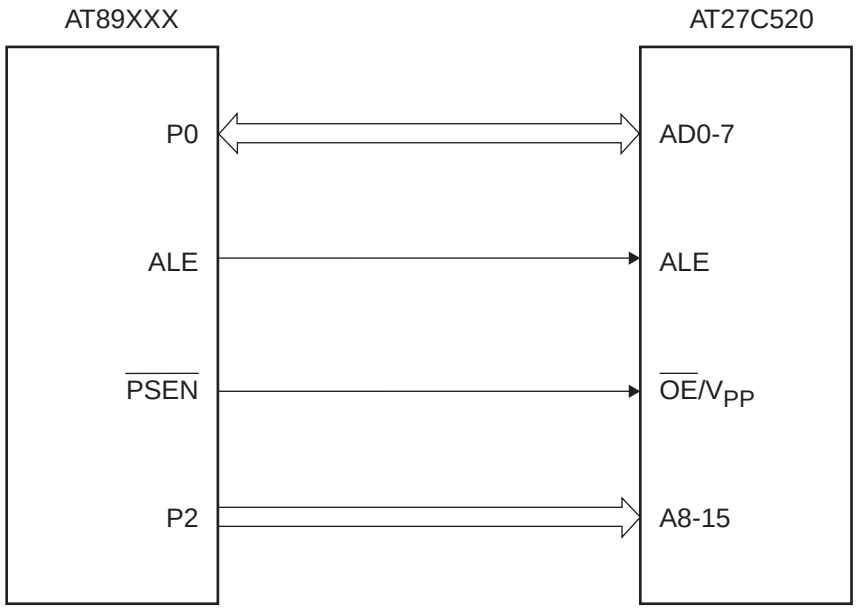

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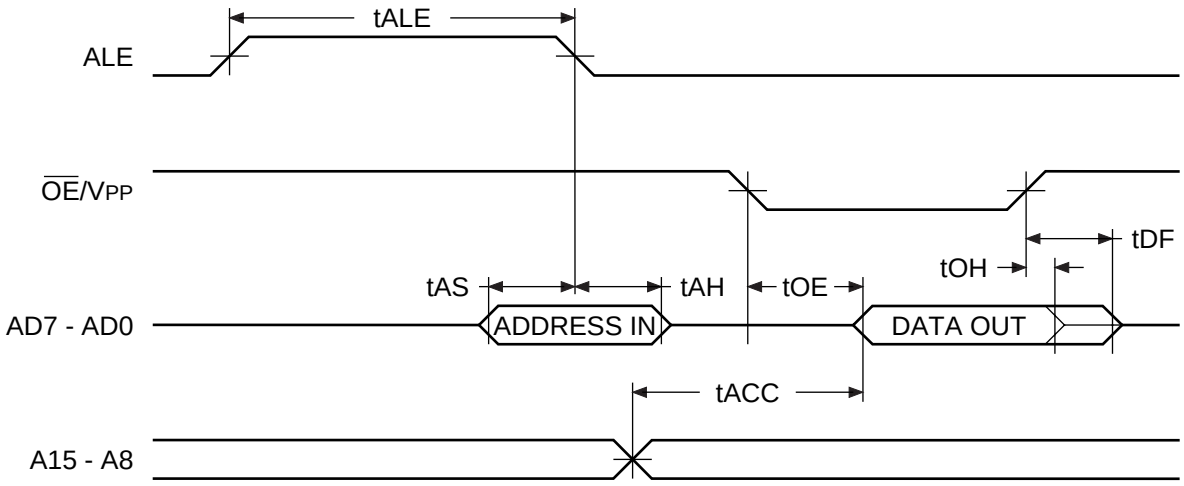
Table 1.

AT89XXX mnemonic	AT27C520 mnemonic
(PORT 0)	**(Multiplexed Address and Data)**
P0.0 (AD0)	AD0
P0.1 (AD1)	AD1
P0.2 (AD2)	AD2
P0.3 (AD3)	AD3
P0.4 (AD4)	AD4
P0.5 (AD5)	AD5
P0.6 (AD6)	AD6
P0.7 (AD7)	AD7
(PORT 2)	**(Address)**
P2.0 (A8)	A8
P2.1 (A9)	A9
P2.2 (A10)	A10
P2.3 (A11)	A11
P2.4 (A12)	A12
P2.5 (A13)	A13
P2.6 (A14)	A14
P2.7 (A15)	A15
(Control)	**(Control)**
ALE	ALE
$\overline{\text{PSEN}}$/	$\overline{\text{OE}}/V_{PP}$

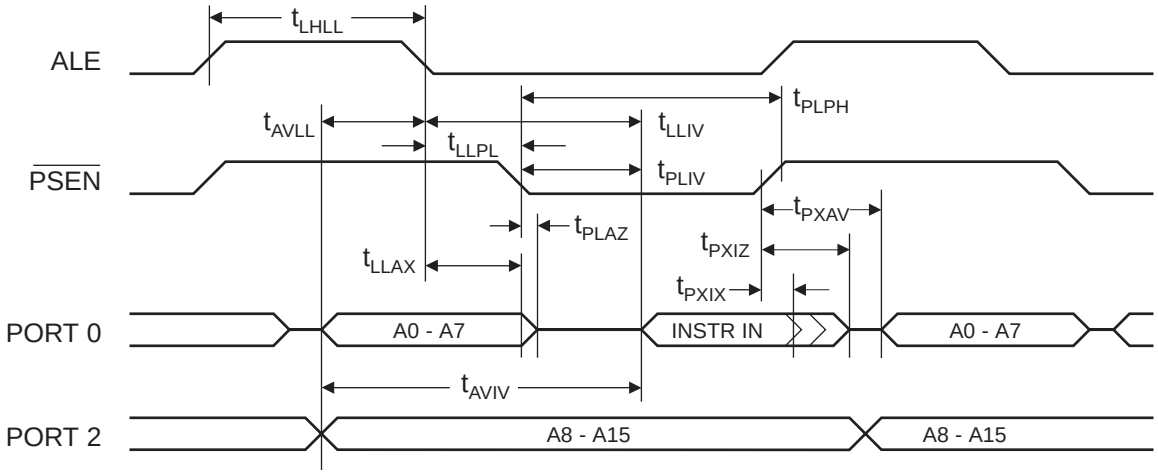
A read cycle for the AT27C520 is achieved as follows:

1. $\overline{\text{OE}}/V_{PP}$ is asserted high by the $\overline{\text{PSEN}}$/line
2. Address Latch Enable (ALE) is asserted high by the ALE line
3. Low order address byte (AD0-7) is asserted by the P0 port
4. High order address byte (A8-15) is asserted by the P2 port
5. ALE is lowered (address is latched)
6. $\overline{\text{OE}}/V_{PP}$ is asserted low by the $\overline{\text{PSEN}}$/line
7. Data is driven by the EPROM onto the P0 port

AT27C520 Read Timing



AT89XXX External Program Memory Read Cycle



Summary

The AT27C520 EPROM provides the ideal External Program Memory for the AT89XXX Microcontroller family. A straightforward, pin to pin connection scheme, with no additional external glue logic or latches, ensures a seamless interface.

Additionally, the AT27C520 is available in a power saving Low Voltage, which makes it the perfect choice for Atmel's Low Voltage 89XXX Microcontrollers. The AT27C520 is now available in space saving TSSOP and SOIC packages. For complete device specifications, please refer to the AT27C520 datasheet.