In The Name of God
COMPUTER ENGINEERING DEPARTMENT OF AMIRKABIR UNIVERSITY OF TECHNOLOGY

Microprocessors Homework 7 -

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All of the delay times are calculated with the clock frequncy of 1Mhz. The delay for writing to EEPROM is 1 ms. Which I used a 1000 loop in order to create this delay.

And the delay for reading from EEPROM is in order of nano seconds which is lower than a single NOP. So I have used only one NOP.

Below are the timing tables for EEPROM 27c64 which I have used in order to use it as an EEPROM.

TABLE 1-3:   READ OPERATION AC CHARACTERISTICS

AC Testing Waveform:	V$_{IH}$ = 2.4V and V$_{IL}$ = 0.45V; V$_{OH}$ = 2.0V V$_{OL}$ = 0.8V					
Output Load:	1 TTL Load + 100 pF					
Input Rise and Fall Times:	10 ns					
Ambient Temperature:	Commercial:		Tamb = 0˚C to +70˚C			
	Industrial:		Tamb = -40˚C to +85˚C			

Parameter	Sym	27C64-12		27C64-15		27C64-17		27C64-20		27C64-25		Units	Conditions
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max		
Address to Output Delay	t$_{ACC}$	—	120	—	150	—	170	—	200	—	250	ns	$\overline{CE} = \overline{OE}$ = V$_{IL}$
$\overline{CE}$ to Output Delay	t$_{CE}$	—	120	—	150	—	170	—	200	—	250	ns	$\overline{OE}$ = V$_{IL}$
$\overline{OE}$ to Output Delay	t$_{OE}$	—	65	—	70	—	70	—	75	—	100	ns	$\overline{CE}$ = V$_{IL}$
$\overline{CE}$ or $\overline{OE}$ to O/P High Impedance	t$_{OFF}$	0	50	0	50	0	50	0	55	0	60	ns	
Output Hold from Address $\overline{CE}$ or $\overline{OE}$, whichever occurs first	t$_{OH}$	0	—	0	—	0	—	0	—	0	—	ns	

TABLE 1-5: **PROGRAMMING AC CHARACTERISTICS**

for Program, Program Verify and Program Inhibit Modes	AC Testing Waveform: V_{IH}=2.4V and V_{IL}=0.45V; V_{OH}=2.0V; V_{OL}=0.8V Ambient Temperature: Tamb=25°C ±5°C V_{CC}= 6.5V ± 0.25V, V_{PP} = V_H = 13.0V ± 0.25V				
Parameter	**Symbol**	**Min**	**Max**	**Units**	**Remarks**
Address Set-Up Time	t_{AS}	2	—	µs	
Data Set-Up Time	t_{DS}	2	—	µs	
Data Hold Time	t_{DH}	2	—	µs	
Address Hold Time	t_{AH}	0	—	µs	
Float Delay (2)	t_{DF}	0	130	ns	
Vcc Set-Up Time	t_{VCS}	2	—	µs	
Program Pulse Width (1)	t_{PW}	95	105	µs	100 µs typical
CE Set-Up Time	t_{CES}	2	—	µs	
OE Set-Up Time	t_{OES}	2	—	µs	
Vpp Set-Up Time	t_{VPS}	2	—	µs	
Data Valid from OE	t_{OE}	—	100	ns	

Note 1: For express algorithm, initial programming width tolerance is 100 µs ±5%.
2: This parameter is only sampled and not 100% tested. Output float is defined as the point where data is no longer driven (see timing diagram).

You can find the datasheet in the attached documents.