

25AA080A/B, 25LC080A/B

8K SPI[™] Bus Serial EEPROM

Device Selection Table

Part Number	Vcc Range	Page Size	Temp. Ranges	Packages
25LC080A	2.5-5.5V	16 Byte	I, E	P, SN, ST, MS
25AA080A	1.8-5.5V	16 Byte	I	P, SN, ST, MS
25LC080B	2.5-5.5V	32 Byte	I, E	P, SN, ST, MS
25AA080B	1.8-5.5V	32 Byte	I	P, SN, ST, MS

Features

- · Max. clock 10 MHz
- Low-power CMOS technology
- 1024 x 8-bit organization
- 16 byte page ('A' version devices)
- 32 byte page ('B' version devices)
- · Write cycle time: 5 ms max.
- · Self-timed ERASE and WRITE cycles
- · Block write protection
 - Protect none, 1/4, 1/2 or all of array
- · Built-in write protection
 - Power-on/off data protection circuitry
 - Write enable latch
- Write-protect pin
- · Sequential read
- · High reliability
 - Endurance: 1,000,000 erase/write cycles
 - Data retention: > 200 yearsESD protection: > 4000V
- · Temperature ranges supported;

- Industrial (I): -40°C to +85°C - Automotive (E): -40°C to +125°C

Pin Function Table

Name	Function	
CS	Chip Select Input	
SO	Serial Data Output	
WP	Write-Protect	
Vss	Ground	
SI	Serial Data Input	
SCK	Serial Clock Input	
HOLD	Hold Input	
Vcc	Supply Voltage	

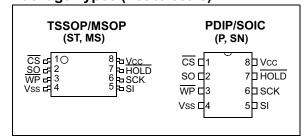
Description

The Microchip Technology Inc. 25AA080A/B, 25LC080A/B (25XX080A/B *) are 8 Kbit Serial Electrically Erasable PROMs. The memory is accessed via a simple Serial Peripheral Interface (SPI $^{\text{TM}}$) compatible serial bus. The bus signals required are a clock input (SCK) plus separate data in (SI) and data out (SO) lines. Access to the device is controlled through a Chip Select ($\overline{\text{CS}}$) input.

Communication to the device can be paused via the hold pin (HOLD). While the device is paused, transitions on its inputs will be ignored, with the exception of chip select, allowing the host to service higher priority interrupts.

The 25XX080A/B is available in standard packages including 8-lead PDIP and SOIC, and advanced packaging including 8-lead MSOP, and 8-lead TSSOP. Pb-free (Pure Matte Sn) finish is also available.

Package Types (not to scale)



SPI is a registered trademark of Motorola Semiconductor.

^{*25}XX080A/B is used in this document as a generic part number for the 25AA080A/B. 25LC080A/B.

1.0 ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings (†)

Vcc	7.0V
All inputs and outputs w.r.t. Vss	0.6V to Vcc +1.0V
Storage temperature	65°C to 150°C
Ambient temperature under bias	65°C to 125°C
ESD protection on all pins	4 kV

† NOTICE: Stresses above those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress rating only and functional operation of the device at those or any other conditions above those indicated in the operational listings of this specification is not implied. Exposure to maximum rating conditions for an extended period of time may affect device reliability.

TABLE 1-1: DC CHARACTERISTICS

I	DC CHARACTERISTICS		Industrial (I) Automotive		-40°C to	+85°C Vcc = 1.8V to 5.5V +125°C Vcc = 2.5V to 5.5V
Param. No.	Sym.	Characteristic	Min.	Max.	Units	Test Conditions
D001	VIH1	High-level input	2.0	Vcc +1	V	Vcc ≥ 2.7V (Note)
D002	VIH2	voltage	0.7 Vcc	Vcc +1	V	Vcc< 2.7V (Note)
D003	VIL1	Low-level input	-0.3	0.8	V	Vcc ≥ 2.7V (Note)
D004	VIL2	voltage	-0.3	0.2 Vcc	V	Vcc < 2.7V (Note)
D005	Vol	Low-level output	_	0.4	V	IoL = 2.1 mA
D006	Vol	voltage	_	0.2	V	IoL = 1.0 mA, Vcc < 2.5V
D007	Vон	High-level output voltage	Vcc -0.5	_	V	IOH = -400 μA
D008	ILI	Input leakage current		±1	μΑ	CS = Vcc, Vin = Vss to Vcc
D009	ILO	Output leakage current		±1	μΑ	CS = Vcc, Vout = Vss to Vcc
D010	CINT	Internal Capacitance (all inputs and outputs)	_	7	pF	TAMB = 25°C, CLK = 1.0 MHz, VCC = 5.0V (Note)
D011	Icc Read		_	6	mA	Vcc = 5.5V; FcLκ = 10.0 MHz; SO = Open
		Operating Current		2.5	mA	Vcc = 2.5V; FcLK = 5.0 MHz; SO = Open
D012	Icc Write		_ _	3	mA	Vcc = 5.5V
D013	Iccs		_	5	μΑ	CS = Vcc = 5.5V, Inputs tied to Vcc or
		Standby Current	_	1	μА	$\frac{\text{Vss}}{\text{CS}}$, TAMB = -40°C TO +125°C $\frac{\text{CS}}{\text{CS}}$ = VCC = 2.5V, Inputs tied to VCC or Vss, TAMB = -40°C TO +85°C

Note: This parameter is periodically sampled and not 100% tested.

TABLE 1-2: AC CHARACTERISTICS

	AC CHARACTERISTICS		Industrial (I): TAMB = -40°C to +85°C			
Param. No.	Sym.	Characteristic	Min.	Max.	Units	Test Conditions
1	FCLK	Clock Frequency	_ _ _	10 5 3	MHz MHz MHz	4.5V ≤ VCC ≤ 5.5V 2.5V ≤ VCC < 4.5V 1.8V ≤ VCC < 2.5V
2	Tcss	CS Setup Time	50 100 150	_ _ _	ns ns ns	4.5V ≤ VCC ≤ 5.5V 2.5V ≤ VCC < 4.5V 1.8V ≤ VCC < 2.5V
3	Тсѕн	CS Hold Time	100 200 250	_ _ _	ns ns ns	4.5V ≤ VCC ≤ 5.5V 2.5V ≤ VCC < 4.5V 1.8V ≤ VCC < 2.5V
4	TCSD	CS Disable Time	50	_	ns	_
5	Tsu	Data Setup Time	10 20 30	_ _ _	ns ns ns	4.5V ≤ Vcc ≤ 5.5V 2.5V ≤ Vcc < 4.5V 1.8V ≤ Vcc < 2.5V
6	THD	Data Hold Time	20 40 50	_ _ _	ns ns ns	4.5V ≤ VCC ≤ 5.5V 2.5V ≤ VCC < 4.5V 1.8V ≤ VCC < 2.5V
7	TR	CLK Rise Time	_	500	ns	(Note 1)
8	TF	CLK Fall Time	_	500	ns	(Note 1)
9	Тні	Clock High Time	50 100 150	_ _ _	ns ns ns	4.5V ≤ VCC ≤ 5.5V 2.5V ≤ VCC < 4.5V 1.8V ≤ VCC < 2.5V
10	TLO	Clock Low Time	50 100 150	_ _ _	ns ns ns	4.5V ≤ VCC ≤ 5.5V 2.5V ≤ VCC < 4.5V 1.8V ≤ VCC < 2.5V
11	TCLD	Clock Delay Time	50	_	ns	_
12	TCLE	Clock Enable Time	50	_	ns	_
13	Tv	Output Valid from Clock Low	_ _ _	50 100 160	ns ns ns	4.5V ≤ VCC ≤ 5.5V 2.5V ≤ VCC < 4.5V 1.8V ≤ VCC < 2.5V
14	Тно	Output Hold Time	0		ns	(Note 1)
15	TDIS	Output Disable Time	_ _ _	40 80 160	ns ns ns	4.5V ≤ VCC ≤ 5.5V (Note 1) 2.5V ≤ VCC < 4.5V (Note 1) 1.8V ≤ VCC < 2.5V (Note 1)
16	Тнѕ	HOLD Setup Time	20 40 80	_ _ _	ns ns ns	4.5V ≤ Vcc ≤ 5.5V 2.5V ≤ Vcc < 4.5V 1.8V ≤ Vcc < 2.5V

Note 1: This parameter is periodically sampled and not 100% tested.

- 2: This parameter is not tested but ensured by characterization. For endurance estimates in a specific application, please consult the Total Endurance™ Model which can be obtained from our web site: www.microchip.com.
- **3:** Two begins on the rising edge of $\overline{\text{CS}}$ after a valid write sequence and ends when the internal write cycle is complete.

TABLE 1-2: AC CHARACTERISTICS (CONTINUED)

	AC CHARACTERISTICS		Industrial (I): TAMB = -40° C to $+85^{\circ}$ C Vcc = 1.8V to 5.5V Automotive (E): TAMB = -40° C to $+125^{\circ}$ C Vcc = 2.5V to 5.5V			
Param. No.	Sym.	Characteristic	Min.	Max.	Units	Test Conditions
17	Тнн	HOLD Hold Time	20 40 80		ns ns ns	4.5V ≤ Vcc ≤ 5.5V 2.5V ≤ Vcc < 4.5V 1.8V ≤ Vcc < 2.5V
18	THZ	HOLD Low to Output High-Z	30 60 160	_ _ _	ns ns ns	4.5V ≤ Vcc ≤ 5.5V (Note 1) 2.5V ≤ Vcc < 4.5V (Note 1) 1.8V ≤ Vcc < 2.5V (Note 1)
19	THV	HOLD High to Output Valid	30 60 160	_ _ _	ns ns ns	4.5V ≤ Vcc ≤ 5.5V 2.5V ≤ Vcc < 4.5V 1.8V ≤ Vcc < 2.5V
20	Twc	Internal Write Cycle Time	_	5	ms	(Note 3)
21	_	Endurance	1,000,000	_	E/W Cycles	(Note 2)

- **Note 1:** This parameter is periodically sampled and not 100% tested.
 - 2: This parameter is not tested but ensured by characterization. For endurance estimates in a specific application, please consult the Total Endurance™ Model which can be obtained from our web site: www.microchip.com.
 - **3:** Two begins on the rising edge of $\overline{\text{CS}}$ after a valid write sequence and ends when the internal write cycle is complete.

TABLE 1-3: AC TEST CONDITIONS

AC Waveform:				
VLO = 0.2V				
VHI = VCC - 0.2V	(Note 1)			
VHI = 4.0V	(Note 2)			
Timing Measurement Reference Level				
Input	0.5 Vcc			
Output	0.5 Vcc			

Note 1: For $Vcc \le 4.0V$

2: For Vcc > 4.0V

FIGURE 1-1: HOLD TIMING

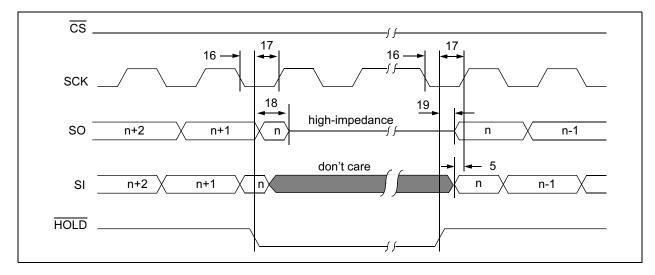


FIGURE 1-2: SERIAL INPUT TIMING

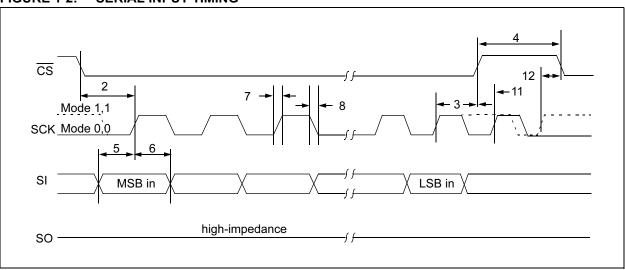
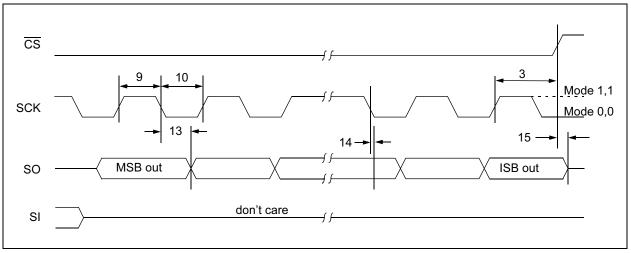


FIGURE 1-3: SERIAL OUTPUT TIMING



2.0 FUNCTIONAL DESCRIPTION

2.1 Principles of Operation

The 25XX080A/B are 1024 byte Serial EEPROMs designed to interface directly with the Serial Peripheral Interface (SPI) Port of many of today's popular microcontroller families, including Microchip's PICmicro® microcontrollers. It may also interface with microcontrollers that do not have a built-in Synchronous Serial Port by using discrete I/O lines programmed properly with the software.

The 25XX080A/B contains an 8-bit instruction register. The device is accessed via the SI pin, with data being clocked in on the <u>rising</u> edge of SCK. The CS pin must be low and the HOLD pin must be high for the entire operation.

Table 2-1 contains a list of the possible instruction bytes and format for device operation. All instructions, addresses, and data are transferred MSB first, LSB last.

Data (SI) is sampled on the first rising edge of SCK after CS goes low. If the clock line is shared with other peripheral devices on the SPI bus, the user can assert the HOLD input and place the 25XX080A/B in 'HOLD' mode. After releasing the HOLD pin, operation will resume from the point when the HOLD was asserted.

2.2 Read Sequence

The device is selected by pulling \overline{CS} low. The 8-bit read instruction is transmitted to the 25XX080A/B followed by the 16-bit address, with the six MSBs of the address being don't care bits. After the correct read instruction and address are sent, the data stored in the memory at the selected address is shifted out on the SO pin. The data stored in the memory at the next address can be read sequentially by continuing to provide clock pulses. The internal address pointer is automatically incremented to the next higher address after each byte of data is shifted out. When the highest address is reached (03FFh), the address counter rolls over to address 0000h allowing the read cycle to be continued indefinitely. The read operation is terminated by raising the \overline{CS} pin (Figure 2-1).

2.3 Write Sequence

Prior to any attempt to write data to the 25XX080A/B, the write enable latch must be set by issuing the WREN instruction (Figure 2-4). This is done by setting $\overline{\text{CS}}$ low and then clocking out the proper instruction into the 25XX080A/B. After all eight bits of the instruction are transmitted, the $\overline{\text{CS}}$ must be brought high to set the write enable latch. If the write operation is initiated immediately after the WREN instruction without $\overline{\text{CS}}$ being brought high, the data will not be written to the array because the write enable latch will not have been properly set.

Once the write enable latch is set, the user may proceed by setting the \overline{CS} low, issuing a WRITE instruction, followed by the 16-bit address, with the six MSBs of the address being don't care bits, and then the data to be written. Up to 16 bytes (25XX080A) or 32 bytes (25XX080B) of data can be sent to the device before a write cycle is necessary. The only restriction is that all of the bytes must reside in the same page.

Note:

Page write operations are limited to writing bytes within a single physical page, regardless of the number of bytes actually being written. Physical page boundaries start at addresses that are integer multiples of the page buffer size (or 'page size') and, end at addresses that are integer multiples of page size - 1. If a Page Write command attempts to write across a physical page boundary, the result is that the data wraps around to the beginning of the current page (overwriting data previously stored there), instead of being written to the next page as might be expected. It is therefore necessary for the application software to prevent page write operations that would attempt to cross a page boundary.

For the data to be actually written to the array, the CS must be brought high after the Least Significant bit (D0) of the *n*th data byte has been clocked in. If $\overline{\text{CS}}$ is brought high at any other time, the write operation will not be completed. Refer to Figure 2-2 and Figure 2-3 for more detailed illustrations on the byte write sequence and the page write sequence respectively. While the write is in progress, the Status Register may be read to check the status of the WPEN, WIP, WEL, BP1 and BP0 bits (Figure 2-6). A read attempt of a memory array location will not be possible during a write cycle. When the write cycle is completed, the write enable latch is reset.

Block Diagram

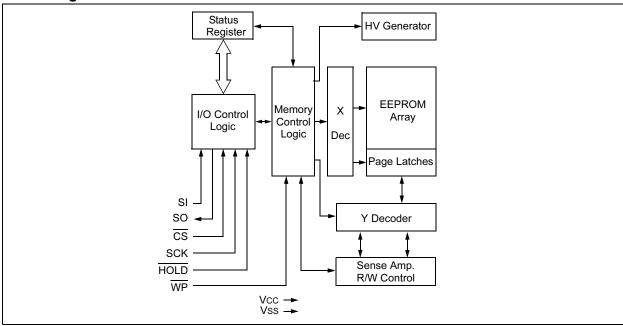


TABLE 2-1: INSTRUCTION SET

Instruction Name	Instruction Format	Description
READ	0000 0011	Read data from memory array beginning at selected address
WRITE	0000 0010	Write data to memory array beginning at selected address
WRDI	0000 0100	Reset the write enable latch (disable write operations)
WREN	0000 0110	Set the write enable latch (enable write operations)
RDSR	0000 0101	Read Status Register
WRSR	0000 0001	Write Status Register

FIGURE 2-1: READ SEQUENCE

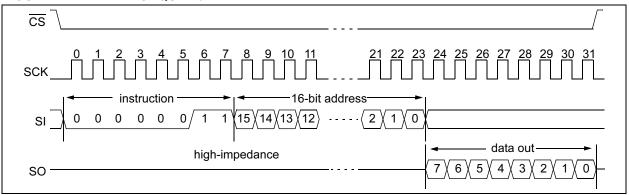


FIGURE 2-2: BYTE WRITE SEQUENCE

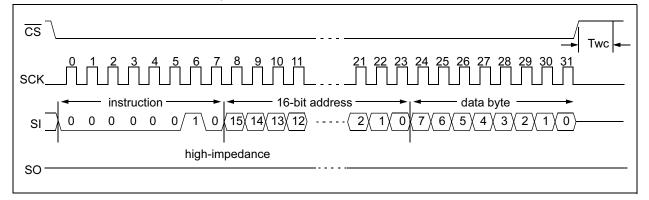
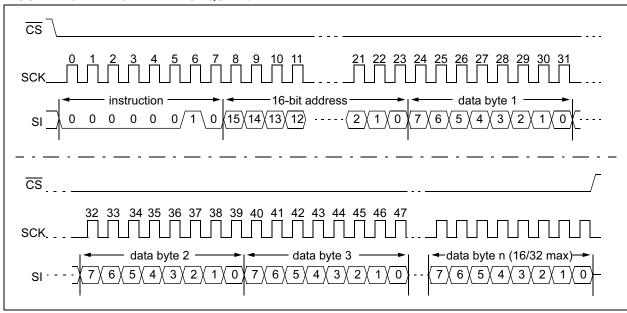


FIGURE 2-3: PAGE WRITE SEQUENCE



2.4 Write Enable (WREN) and Write Disable (WRDI)

The 25XX080A/B contains a write enable latch. See Table 2-4 for the Write-Protect Functionality Matrix. This latch must be set before any write operation will be completed internally. The WREN instruction will set the latch, and the WRDI will reset the latch.

The following is a list of conditions under which the write enable latch will be reset:

- Power-up
- WRDI instruction successfully executed
- · WRSR instruction successfully executed
- · WRITE instruction successfully executed

FIGURE 2-4: WRITE ENABLE SEQUENCE (WREN)

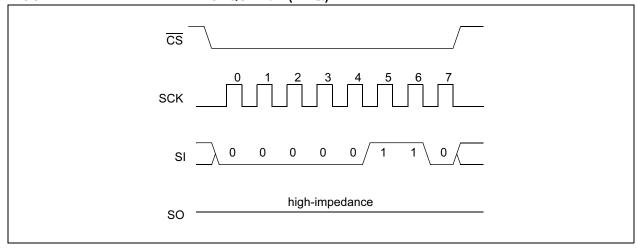
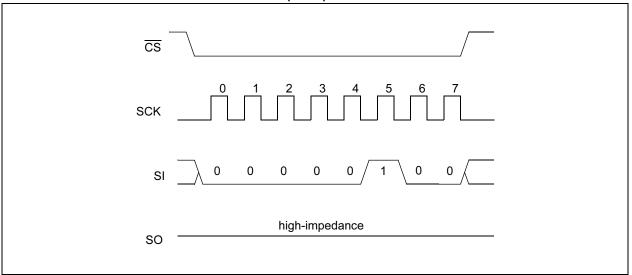


FIGURE 2-5: WRITE DISABLE SEQUENCE (WRDI)



2.5 Read Status Register Instruction (RDSR)

The Read Status Register instruction (RDSR) provides access to the Status Register. The Status Register may be read at any time, even during a write cycle. The Status Register is formatted as follows:

TABLE 2-2: STATUS REGISTER

7	6	5	4	3	2	1	0
W/R	_	-	-	W/R	W/R	R	R
WPEN	Х	Χ	Χ	BP1	BP0	WEL	WIP
W/R = writable/readable. R = read-only.							

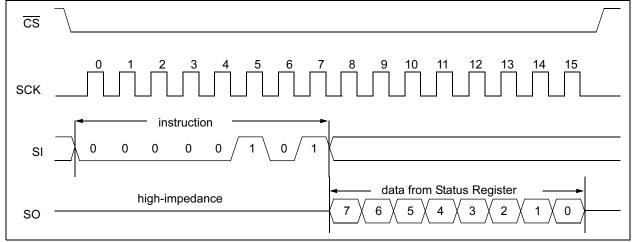
The **Write-In-Process (WIP)** bit indicates whether the 25XX080A/B is busy with a write operation. When set to a '1', a write is in progress, when set to a '0', no write is in progress. This bit is read-only.

The Write Enable Latch (WEL) bit indicates the status of the write enable latch and is read only. When set to a '1', the latch allows writes to the array or the Status Register, when set to a '0', the latch prohibits writes to the array or the Status Register. The state of this bit can always be updated via the WREN or WRDI commands regardless of the state of write protection on the Status Register. These commands are shown in Figure 2-4 and Figure 2-5.

The **Block Protection (BP0 and BP1)** bits indicate which blocks are currently write-protected. These bits are set by the user issuing the WRSR instruction, which is in Figure 2-7. These bits are nonvolatile and are shown in Table 2-3.

See Figure 2-6 for the RDSR timing sequence.

FIGURE 2-6: READ STATUS REGISTER TIMING SEQUENCE (RDSR)



2.6 Write Status Register Instruction (WRSR)

The Write Status Register instruction (WRSR) allows the user to write to the nonvolatile bits in the Status Register as shown in Table 2-2. The user is able to select one of four levels of protection for the array by writing to the appropriate bits in the Status Register. The array is divided up into four segments. The user has the ability to write-protect none, one, two or all four of the segments of the array. The partitioning is controlled as shown in Table 2-3.

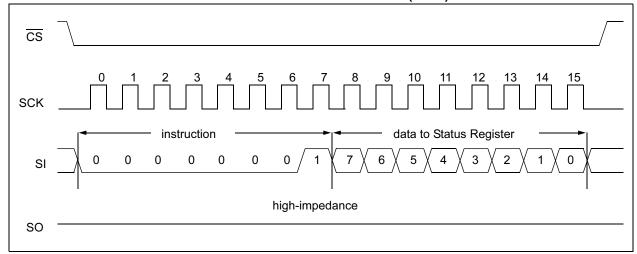
The Write-Protect Enable (WPEN) bit is also a nonvolatile bit that is available as an enable bit for the \overline{WP} pin. The Write-Protect (\overline{WP}) pin and the Write-Protect Enable (WPEN) bit in the Status Register control the programmable hardware write-protect feature. Hardware write protection is enabled when \overline{WP} pin is low and the WPEN bit is high. Hardware write protection is disabled when either the \overline{WP} pin is high or the WPEN bit is low. When the chip is hardware write-protected, only writes to nonvolatile bits in the Status Register are disabled. See Table 2-4 for a matrix of functionality on the WPEN bit.

See Figure 2-7 for the WRSR timing sequence.

TABLE 2-3: ARRAY PROTECTION

BP1	BP0	Array Addresses Write-Protected
0	0	none
0	1	upper 1/4 (0300h - 03FFh)
1	0	upper 1/2 (0200h - 03FFh)
1	1	all (0000h - 03FFh)

FIGURE 2-7: WRITE STATUS REGISTER TIMING SEQUENCE (WRSR)



2.7 Data Protection

The following protection has been implemented to prevent inadvertent writes to the array:

- The write enable latch is reset on power-up
- A write enable instruction must be issued to set the write enable latch
- After a byte write, page write or Status Register write, the write enable latch is reset
- CS must be set high after the proper number of clock cycles to start an internal write cycle
- Access to the array during an internal write cycle is ignored and programming is continued

2.8 Power-On State

The 25XX080A/B powers on in the following state:

- The device is in low-power Standby mode (CS = 1)
- The write enable latch is reset
- SO is in high-impedance state
- A high-to-low-level transition on CS is required to enter active state

TABLE 2-4: WRITE-PROTECT FUNCTIONALITY MATRIX

WEL (SR bit 1)	WPEN (SR bit 7)	WP (pin 3)	Protected Blocks	Unprotected Blocks	Status Register
0	Х	х	Protected	Protected	Protected
1	0	х	Protected	Writable	Writable
1	1	0 (low)	Protected	Writable	Protected
1	1	1 (high)	Protected	Writable	Writable

x = don't care

3.0 PIN DESCRIPTIONS

The descriptions of the pins are listed in Table 3-1.

TABLE 3-1: PIN FUNCTION TABLE

Name	Pin Number	Function
CS	1	Chip Select Input
SO	2	Serial Data Output
WP	3	Write-Protect Pin
Vss	4	Ground
SI	5	Serial Data Input
SCK	6	Serial Clock Input
HOLD	7	Hold Input
Vcc	8	Supply Voltage

3.1 Chip Select (CS)

A low level on this pin selects the device. A high level deselects the device and forces it into Standby mode. However, a programming cycle which is already initiated or in progress will be completed, regardless of the $\overline{\text{CS}}$ input signal. If $\overline{\text{CS}}$ is brought high during a program cycle, the device will go into Standby mode as soon as the programming cycle is complete. When the device is deselected, SO goes to the high-impedance state, allowing multiple parts to share the same SPI bus. A low-to-high transition on $\overline{\text{CS}}$ after a valid write sequence initiates an internal write cycle. After power-up, a low level on $\overline{\text{CS}}$ is required prior to any sequence being initiated.

3.2 Serial Output (SO)

The SO pin is used to transfer data out of the 25XX080A/B. During a read cycle, data is shifted out on this pin after the falling edge of the serial clock.

3.3 Write-Protect (WP)

This pin is used in conjunction with the WPEN bit in the Status Register to prohibit writes to the nonvolatile bits in the Status Register. When WP is low and WPEN is high, writing to the nonvolatile bits in the Status Register is disabled. All other operations function normally. When WP is high, all functions, including writes to the nonvolatile bits in the Status Register operate normally. If the WPEN bit is set, WP low during a Status Register write sequence will disable writing to the Status Register. If an internal write cycle has already begun, WP going low will have no effect on the write.

The $\overline{\text{WP}}$ pin function is blocked when the WPEN bit in the Status Register is low. This allows the user to install the 25XX080A/B in a system with $\overline{\text{WP}}$ pin grounded and still be able to write to the Status Register. The $\overline{\text{WP}}$ pin functions will be enabled when the WPEN bit is set high.

3.4 Serial Input (SI)

The SI pin is used to transfer data into the device. It receives instructions, addresses and data. Data is latched on the rising edge of the serial clock.

3.5 Serial Clock (SCK)

The SCK is used to synchronize the communication between a master and the 25XX080A/B. Instructions, addresses or data present on the SI pin are latched on the rising edge of the clock input, while data on the SO pin is updated after the falling edge of the clock input.

3.6 Hold (HOLD)

The HOLD pin is used to suspend transmission to the 25XX080A/B while in the middle of a serial sequence without having to retransmit the entire sequence again. It must be held high any time this function is not being used. Once the device is selected and a serial sequence is underway, the HOLD pin may be pulled low to pause further serial communication without resetting the serial sequence. The HOLD pin must be brought low while SCK is low, otherwise the HOLD function will not be invoked until the next SCK high-tolow transition. The 25XX080A/B must remain selected during this sequence. The SI, SCK and SO pins are in a high impedance state during the time the device is paused and transitions on these pins will be ignored. To resume serial communication, HOLD must be brought high while the SCK pin is low, otherwise serial communication will not resume. Lowering the HOLD line at any time will tri-state the SO line.

4.0 PACKAGING INFORMATION

4.1 Package Marking Information

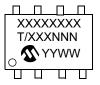
8-Lead MSOP (150 mil)

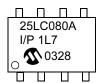




MSOP 1st Line Marking Codes						
Device	std mark	Pb-free mark				
25AA080A	5A8A	G5A8A				
25AA080B	5A8B	G5A8B				
25LC080A	5L8A	G5L8A				
25LC080B	5L8B	G5L8B				

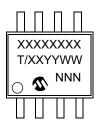
8-Lead PDIP





Example:

8-Lead SOIC







8-Lead TSSOP







TSSOP 1st Line Marking Codes						
Device	std mark	Pb-free mark				
25AA080A	5A8A	NA8A				
25AA080B	5A8B	NA8B				
25LC080A	5L8A	NL8A				
25LC080B	5L8B	NL8B				
		·				

Legend: XX...X Part number

T Temperature (I, E)
Blank Commercial

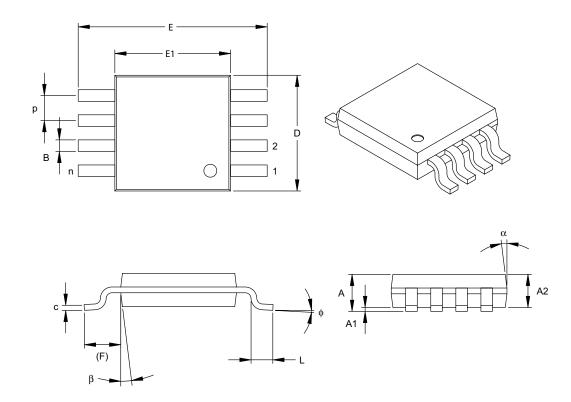
YY Year code (last 2 digits of calendar year) except TSSOP

and MSOP which use only the last 1 digit Week code (week of January 1 is week '01')

WW Week code (week of January 1 is well NNN Alphanumeric traceability code

Note: Custom marking available.

8-Lead Plastic Micro Small Outline Package (MS) (MSOP)



	Units		INCHES		М	ILLIMETERS	*
Dimension Lim	its	MIN	NOM	MAX	MIN	NOM	MAX
Number of Pins	n		8			8	
Pitch	р		.026 BSC		0.65 BSC		
Overall Height	Α	-	-	.043	-	-	1.10
Molded Package Thickness	A2	.030	.033	.037	0.75	0.85	0.95
Standoff	A1	.000	-	.006	0.00	-	0.15
Overall Width	E		.193 TYP.		4.90 BSC		
Molded Package Width	E1		.118 BSC			3.00 BSC	
Overall Length	D		.118 BSC		3.00 BSC		
Foot Length	L	.016	.024	.031	0.40	0.60	0.80
Footprint (Reference)	F	.037 REF 0.95 REF			0.95 REF		
Foot Angle	ф	0°	-	8°	0°	-	8°
Lead Thickness	С	.003	.006	.009	0.08	-	0.23
Lead Width	В	.009	.012	.016	0.22	-	0.40
Mold Draft Angle Top	α	5°	-	15°	5°	-	15°
Mold Draft Angle Bottom	β	5°	-	15°	5°	-	15°

^{*}Controlling Parameter

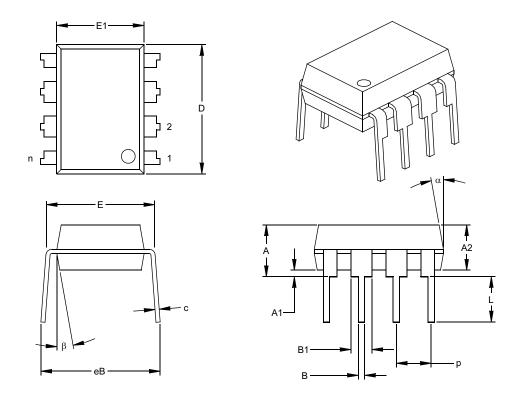
Notes:

Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" (0.254mm) per side.

JEDEC Equivalent: MO-187

Drawing No. C04-111

8-Lead Plastic Dual In-line (P) - 300 mil (PDIP)



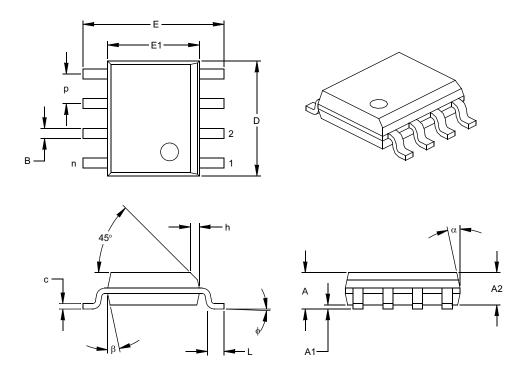
	Units		INCHES*		N	IILLIMETERS	3
Dimensio	n Limits	MIN	NOM	MAX	MIN	NOM	MAX
Number of Pins	n		8			8	
Pitch	р		.100			2.54	
Top to Seating Plane	Α	.140	.155	.170	3.56	3.94	4.32
Molded Package Thickness	A2	.115	.130	.145	2.92	3.30	3.68
Base to Seating Plane	A1	.015			0.38		
Shoulder to Shoulder Width	Е	.300	.313	.325	7.62	7.94	8.26
Molded Package Width	E1	.240	.250	.260	6.10	6.35	6.60
Overall Length	D	.360	.373	.385	9.14	9.46	9.78
Tip to Seating Plane	L	.125	.130	.135	3.18	3.30	3.43
Lead Thickness	С	.008	.012	.015	0.20	0.29	0.38
Upper Lead Width	B1	.045	.058	.070	1.14	1.46	1.78
Lower Lead Width	В	.014	.018	.022	0.36	0.46	0.56
Overall Row Spacing §	eВ	.310	.370	.430	7.87	9.40	10.92
Mold Draft Angle Top	α	5	10	15	5	10	15
Mold Draft Angle Bottom	β	5	10	15	5	10	15

Notes:
Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" (0.254mm) per side.

JEDEC Equivalent: MS-001
Drawing No. C04-018

^{*} Controlling Parameter § Significant Characteristic

8-Lead Plastic Small Outline (SN) - Narrow, 150 mil (SOIC)



	Units		INCHES*		N	IILLIMETERS	3
Dimension	Limits	imits MIN NOM I		MAX	MIN	NOM	MAX
Number of Pins	n		8			8	
Pitch	р		.050			1.27	
Overall Height	Α	.053	.061	.069	1.35	1.55	1.75
Molded Package Thickness	A2	.052	.056	.061	1.32	1.42	1.55
Standoff §	A1	.004	.007	.010	0.10	0.18	0.25
Overall Width	Е	.228	.237	.244	5.79	6.02	6.20
Molded Package Width	E1	.146	.154	.157	3.71	3.91	3.99
Overall Length	D	.189	.193	.197	4.80	4.90	5.00
Chamfer Distance	h	.010	.015	.020	0.25	0.38	0.51
Foot Length	L	.019	.025	.030	0.48	0.62	0.76
Foot Angle	ф	0	4	8	0	4	8
Lead Thickness	С	.008	.009	.010	0.20	0.23	0.25
Lead Width	В	.013	.017	.020	0.33	0.42	0.51
Mold Draft Angle Top	α	0	12	15	0	12	15
Mold Draft Angle Bottom	β	0	12	15	0	12	15

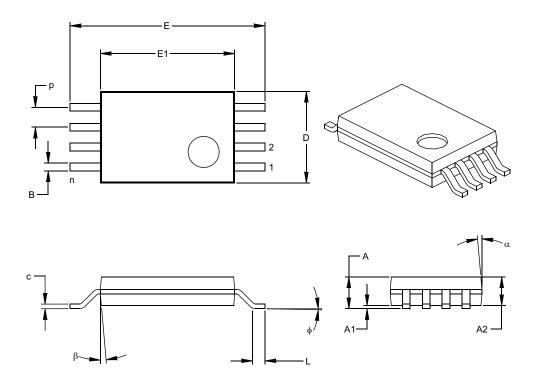
Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" (0.254mm) per side.

JEDEC Equivalent: MS-012

Drawing No. C04-057

^{*} Controlling Parameter § Significant Characteristic

8-Lead Plastic Thin Shrink Small Outline (ST) – 4.4 mm (TSSOP)



	Units		INCHES		N	IILLIMETERS) *	
Dimensio	n Limits	MIN NOM MAX		MAX	MIN	NOM	MAX	
Number of Pins	n		8			8		
Pitch	р		.026			0.65		
Overall Height	Α			.043			1.10	
Molded Package Thickness	A2	.033	.035	.037	0.85	0.90	0.95	
Standoff §	A1	.002	.004	.006	0.05	0.10	0.15	
Overall Width	Е	.246	.251	.256	6.25	6.38	6.50	
Molded Package Width	E1	.169	.173	.177	4.30	4.40	4.50	
Molded Package Length	D	.114	.118	.122	2.90	3.00	3.10	
Foot Length	L	.020	.024	.028	0.50	0.60	0.70	
Foot Angle	ф	0	4	8	0	4	8	
Lead Thickness	О	.004	.006	.008	0.09	0.15	0.20	
Lead Width	В	.007	.010	.012	0.19	0.25	0.30	
Mold Draft Angle Top	α	0	5	10	0	5	10	
Mold Draft Angle Bottom	β	0	5	10	0	5	10	

^{*} Controlling Parameter

Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .005" (0.127mm) per side.

JEDEC Equivalent: MO-153

Drawing No. C04-086

[§] Significant Characteristic

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PART NO. Device Ta	<u>X</u> pe & Re	eel	X /XX X X X X X X X X X	á	Examples: a) 25AA080A-I/MS = 8 Kbit, 16-byte page, 1.8V Serial EEPROM, Industrial temp., MSOP package b) 25AA080B-I/STG = 8 Kbit, 32-byte page, 1.8V
Device	25AA08 25AA08 25LC08 25LC08	80B 80A	8 Kbit, 1.8V, 32 Byte Page SPI Serial EEPROM	C	Serial EEPROM, Industrial temp., TSSOP package, Pb-free 25AA080AT-I/SN = 8 Kbit, 16-byte page, 1.8V Serial EEPROM, Industrial temp., Tape & Reel, SOIC package 25LC080A-I/MSG = 8 Kbit, 16-byte page, 2.5V
Tape & Reel	Blank T	= =	Standard packaging Tape and Reel		Serial EEPROM, Industrial temp., MSOP package, Pb-free
Temperature Range	I E	=	-40°C to+85°C -40°C to+125°C	f	 25LC080BT-I/SN = 8 Kbit, 32-byte page, 2.5V Serial EEPROM, Industrial temp., Tape & Reel, SOIC package 25LC080BT-I/ST = 8 Kbit, 32-byte page, 2.5V
Package	MS P SN ST	= = =	Plastic MSOP (Micro Small Outline), 8-lead Plastic DIP (300 mil body), 8-lead Plastic SOIC (150 mil body), 8-lead TSSOP, 8-lead		Serial EEPROM, Industrial temp., Tape & Reel, TSSOP package
Lead Finish	Blank G	= =	Standard 63% / 37% Sn/Pb Matte Tin (Pure Sn)		

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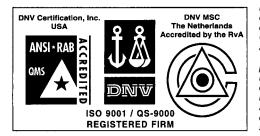
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