MICROCHIP®   25AA080/25LC080/25C080

8K SPI™ Bus Serial EEPROM

Device Selection Table

| Part Number	Vcc Range	Max. Clock Frequency	Temp. Ranges
25AA080	1.8-5.5V	1 MHz	I
25LC080	2.5-5.5V	2 MHz	I
25C080	4.5-5.5V	3 MHz	I,E

Features:

• Low-power CMOS technology:
  - Write current: 3 mA maximum
  - Read current: 500 μA typical
  - Standby current: 500 nA typical
• 1024 x 8-bit organization
• 16 byte page
• 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 M cycles
  - Data retention: > 200 years
  - ESD protection: > 4000V
• 8-pin PDIP and SOIC (150 mil)
• Temperature ranges supported:
  - Industrial (I):   -40°C to +85°C
  - Automotive (E) (25C080): -40°C to +125°C

Description:

The Microchip Technology Inc. 25AA080/25LC080/25C080 (25XX080*) are 8 Kbit Serial Electrically Erasable PROMs. The memory is accessed via a simple Serial Peripheral Interface™ (SPI™) 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 (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.

Package Types
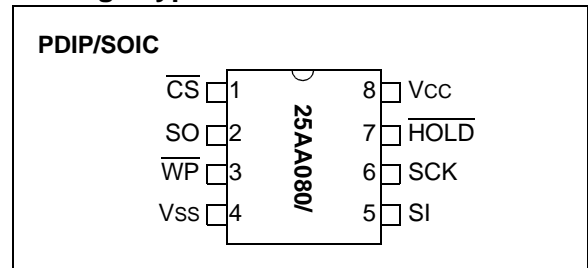
Block Diagram
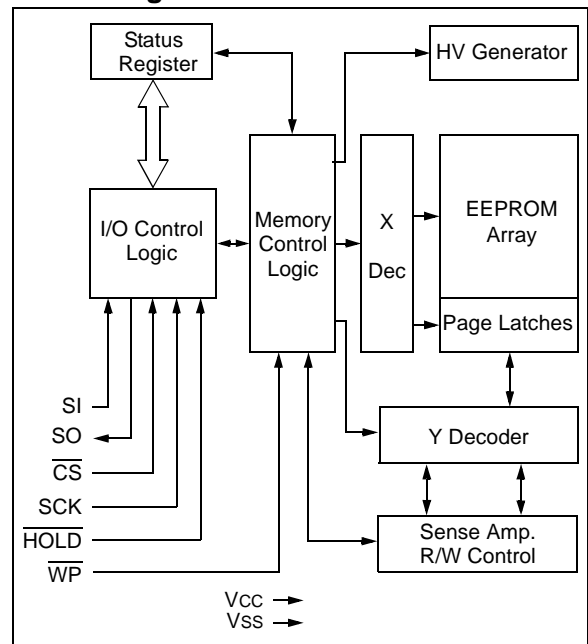
*25XX080 is used in this document as a generic part number for the 25AA080/25LC080/25C080 devices.

SPI™ is a trademark of Motorola Inc.

25AA080/25LC080/25C080

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..-40°C to 125°C

Soldering temperature of leads (10 seconds) ....+300°C

ESD protection on all pins... 4 KV

† NOTICE: Stresses above those listed under '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.

1.1   DC Characteristics

DC CHARACTERISTICS			Industrial (I): T_A = -40°C to +85°C Vcc = 1.8V to 5.5V Automotive (E): T_A = -40°C to +125°C Vcc = 4.5V to 5.5V (25C080 only)				
Param. No.	Sym.	Characteristic	Min.	Max.	Units	Test Conditions	
D001	V_{IH1}	High-level input voltage	2.0	Vcc+1	V	Vcc ≥ 2.7V **(Note)**	
D002	V_{IH2}		0.7 Vcc	Vcc+1	V	Vcc< 2.7V **(Note)**	
D003	V_{IL1}	Low-level input voltage	-0.3	0.8	V	Vcc ≥ 2.7V **(Note)**	
D004	V_{IL2}		-0.3	0.3 Vcc	V	Vcc < 2.7V **(Note)**	
D005	V_{OL}	Low-level output voltage	—	0.4	V	I_{OL} = 2.1 mA	
D006	V_{OL}		—	0.2	V	I_{OL} = 1.0 mA, Vcc < 2.5V	
D007	V_{OH}	High-level output voltage	Vcc -0.5	—	V	I_{OH} = -400 µA	
D008	I_{LI}	Input leakage current	-10	10	µA	$\overline{CS}$ = Vcc, V_{IN} = Vss TO Vcc	
D009	I_{LO}	Output leakage current	-10	10	µA	$\overline{CS}$ = Vcc, V_{OUT} = Vss TO Vcc	
D010	C_{INT}	Internal Capacitance (all inputs and outputs)	—	7	pF	T_A = 25°C, CLK = 1.0 MHz, Vcc = 5.0V **(Note)**	
D011	Icc Read	Operating Current	— —	1 500	mA µA	Vcc = 5.5V; F_{CLK} = 3.0 MHz; SO = Open Vcc = 2.5V; F_{CLK} = 2.0 MHz; SO = Open	
D012	Icc Write		— —	5 3	mA mA	Vcc = 5.5V Vcc = 2.5V	
D013	Iccs	Standby Current	— —	5 1	µA µA	$\overline{CS}$ = Vcc = 5.5V, Inputs tied to Vcc or Vss $\overline{CS}$ = Vcc = 2.5V, Inputs tied to Vcc or Vss	

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

1.2   AC Characteristics

AC CHARACTERISTICS						Industrial (I): TA = -40°C to +85°C VCC = 1.8V to 5.5V Automotive (E): TA = -40°C to +125°C VCC = 4.5V to 5.5V (25C080 only)
Param. No.	Sym.	Characteristic	Min.	Max.	Units	Test Conditions
1	FCLK	Clock Frequency	— — —	3 2 1	MHz MHz MHz	VCC = 4.5V to 5.5V VCC = 2.5V to 4.5V VCC = 1.8V to 2.5V
2	TCSS	CS Setup Time	100 250 500	— — —	ns ns ns	VCC = 4.5V to 5.5V VCC = 2.5V to 4.5V VCC = 1.8V to 2.5V
3	TCSH	CS Hold Time	150 250 475	— — —	ns ns ns	VCC = 4.5V to 5.5V VCC = 2.5V to 4.5V VCC = 1.8V to 2.5V
4	TCSD	CS Disable Time	500	—	ns	—
5	Tsu	Data Setup Time	30 50 50	— — —	ns ns ns	VCC = 4.5V to 5.5V VCC = 2.5V to 4.5V VCC = 1.8V to 2.5V
6	THD	Data Hold Time	50 100 100	— — —	ns ns ns	VCC = 4.5V to 5.5V VCC = 2.5V to 4.5V VCC = 1.8V to 2.5V
7	TR	CLK Rise Time	—	2	µs	**(Note 1)**
8	TF	CLK Fall Time	—	2	µs	**(Note 1)**
9	THI	Clock High Time	150 230 475	— — —	ns ns ns	VCC = 4.5V to 5.5V VCC = 2.5V to 4.5V VCC = 1.8V to 2.5V
10	TLO	Clock Low Time	150 230 475	— — —	ns ns ns	VCC = 4.5V to 5.5V VCC = 2.5V to 4.5V VCC = 1.8V to 2.5V
11	TCLD	Clock Delay Time	50	—	ns	—
12	TCLE	Clock Enable Time	50	—	ns	—
13	TV	Output Valid from Clock Low	— — —	150 230 475	ns ns ns	VCC = 4.5V to 5.5V VCC = 2.5V to 4.5V VCC = 1.8V to 2.5V
14	THO	Output Hold Time	0	—	ns	**(Note 1)**
15	TDIS	Output Disable Time	— — —	200 250 500	ns ns ns	VCC = 4.5V to 5.5V **(Note 1)** VCC = 2.5V to 4.5V **(Note 1)** VCC = 1.8V to 2.5V **(Note 1)**
16	THS	HOLD Setup Time	100 100 200	— — —	ns ns ns	VCC = 4.5V to 5.5V VCC = 2.5V to 4.5V VCC = 1.8V to 2.5V
17	THH	HOLD Hold Time	100 100 200	— — —	ns ns ns	VCC = 4.5V to 5.5V VCC = 2.5V to 4.5V VCC = 1.8V to 2.5V
18	THZ	HOLD Low to Output High-Z	100 150 200	— — —	ns ns ns	VCC = 4.5V to 5.5V **(Note 1)** VCC = 2.5V to 4.5V **(Note 1)** VCC = 1.8V to 2.5V **(Note 1)**
19	THV	HOLD High to Output Valid	100 150 200	— — —	ns ns ns	VCC = 4.5V to 5.5V VCC = 2.5V to 4.5V VCC = 1.8V to 2.5V
20	TWC	Internal Write Cycle Time	—	5	ms	—
21	—	Endurance	1M	—	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 Microchip's web site

8-Lead Plastic Small Outline (SN) – Narrow, 150 mil (SOIC)
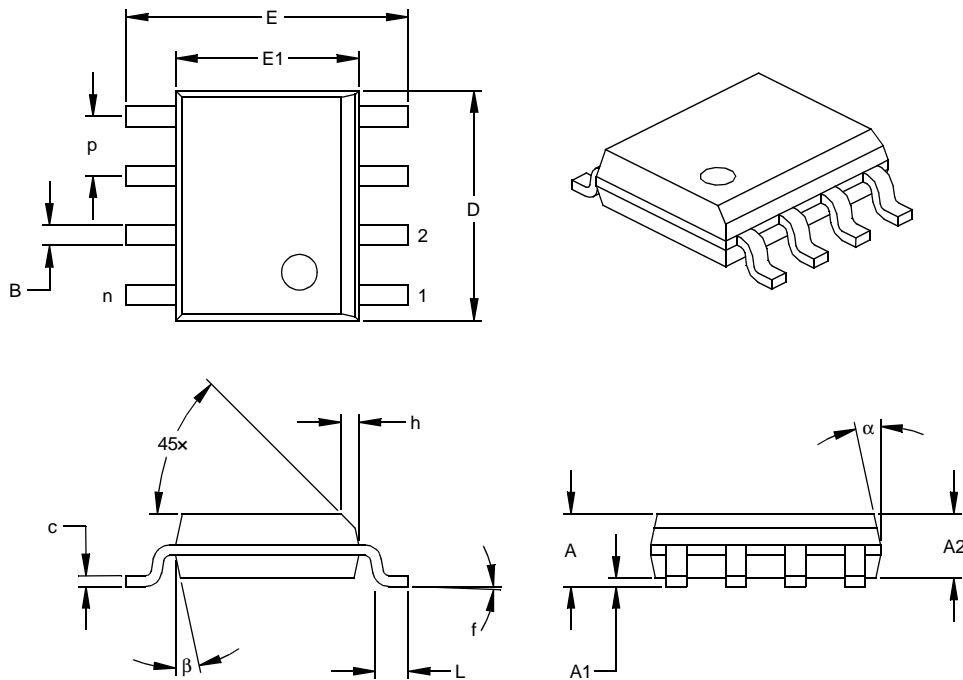
	Units	INCHES*			MILLIMETERS		
Dimension Limits		MIN	NOM	MAX	MIN	NOM	MAX
Number of Pins	n		8			8	
Pitch	p		.050			1.27	
Overall Height	A	.053	.061	.069	1.35	1.55	1.75
Molded Package Thickness	A2	.052	.056	.061	1.32	1.42	1.55
Standoff §	A1	.004	.007	.010	0.10	0.18	0.25
Overall Width	E	.228	.237	.244	5.79	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	f	0	4	8	0	4	8
Lead Thickness	c	.008	.009	.010	0.20	0.23	0.25
Lead Width	B	.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

* Controlling Parameter
§ Significant Characteristic

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-012
Drawing No. C04-057

PRODUCT IDENTIFICATION SYSTEM

To order or obtain information, e.g., on pricing or delivery, refer to the factory or the listed sales office.

PART NO.	X	/XX	XXX
Device	Temperature Range	Package	Pattern

Device   25AA080: 8 Kbit 1.8V SPI Serial EEPROM
            25AA080T: 8 Kbit 1.8V SPI Serial EEPROM
            (Tape and Reel)
            25LC080: 8 Kbit 2.5V SPI Serial EEPROM
            25LC080: 8 Kbit 2.5V SPI Serial EEPROM
            (Tape and Reel)
            25C080: 8 Kbit 5.0V SPI Serial EEPROM
            25C080: 8 Kbit 5.0V SPI Serial EEPROM
            (Tape and Reel)

Temperature   I   = -40°C to +85°C
Range   E   = -40°C to +125°C

Package   P   =   Plastic DIP (300 mil body), 8-lead
               SN   =   Plastic SOIC (150 mil body), 8-lead

Examples:

a) 25AA080-I/SN: Industrial Temp., SOIC package

b) 25AA080T-I/SN: Tape and Reel, Industrial Temp., SOIC package

c) 25LC080-I/SN: Industrial Temp., SOIC package

d) 25LC080T-I/SN: Tape and Reel, Industrial Temp., SOIC package

e) 25C080-I/P: Industrial Temp., PDIP package

f) 25C080-I/SN: Industrial Temp., SOIC package

g) 25C080T-I/SN: Tape and Reel, Industrial Temp., SOIC package

h) 25C080-E/SN: Extended Temp., SOIC package